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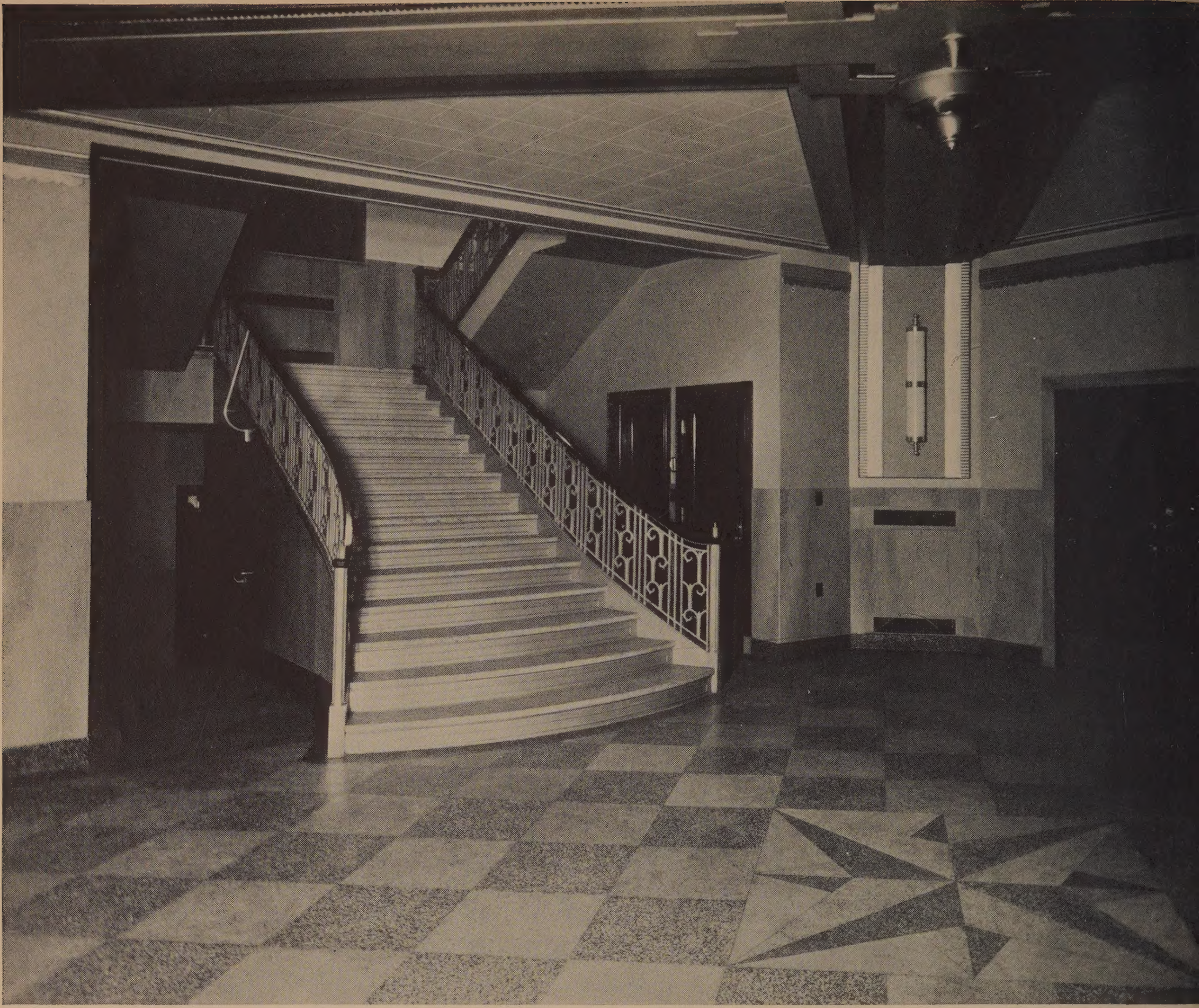


ALPENA COUNTY COURT HOUSE
Alpena, Michigan

William H. Kuni, Architect,
Detroit, Michigan

Henry C. Weber Construction Co.,
Contractors, Bay City, Michigan

John B. Rossi Co., Terrazzo Contractors

One of the modern court houses in Michigan and the first building of its type to be built of architectural concrete in the middle-west is Alpena County Court House. Its exterior treatment is vigorous, with strong verticals and deep reveals (see front cover). Above is a view of the lobby with a beautiful floor of terrazzo. Italian marble chips were used in making the terrazzo.

Architectural
CONCRETE

Alpena County Court House

By William H. Kuni, Architect

In many ways the new court house at Alpena, Mich., is a pioneering project. When the citizens of Alpena County were willing that their new court house should cast aside the medieval robes of last century's architecture for those of a practical, modern cut, their pioneering spirit was as real as that of their ancestors who cleared the forests and fought the Indians. And when Alpena court house became the first monumental public building in Michigan and the middlewest to be built of monolithic concrete, a new era was introduced into the construction practice of this great region. Now finished and occupied, the new court house is modern in style and appearance, construction and material—a pioneer.

After the old court house—whose floors bore the marks of the heavy boots of men from the lumbering camps of days gone by—was destroyed by fire on November 22, 1932, there followed considerable discussion as to whether the exterior of the new building should be of Bedford limestone, as used in the Alpena post office; face brick, as used in the high school; native stone, as used in the depot—or monolithic concrete. Bids were taken on all four of these types of construction and monolithic concrete was finally selected since it not only meant a saving in cost to Alpena County, but offered the further advantage of being built of native materials by local labor, thereby giving more employment to home people and keeping a larger share of the money in the community.

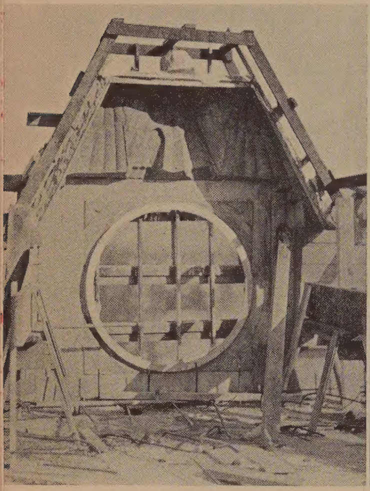
There is very little in the design to remind one of familiar court house architecture; but one would not mistake it for any other type of structure. The scales of Justice are there; so are the lamp of Wisdom and the tablets of Law; and there is the omnipresent clock without which a county court house could never be complete. But the clock doesn't boom out from a gilded dome, and it does keep the right time—which are two novelties. And Justice and Law are balanced—as they always should be—as the only purely decorative detail on the entire building. Otherwise, the design runs to wide, plain pilasters, tall fluted columns and deep reveals with generous window areas.

The new court house is a two-story building with a full basement, 96 ft. x 67 ft., rising approximately 41 ft. above the sidewalk line. Part of the basement is 5 ft. below ground water level and the main part of the basement is right down to the water line. It was necessary to design the entire basement floor to act as one large mat footing and to reinforce it heavily with steel and inverted beams under the floor to resist the pressure of ground water. The basement walls and floors were waterproofed.

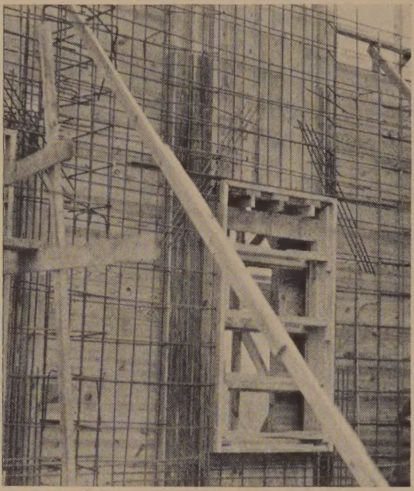
Walls of the building vary in thickness, but are for the most part 18 to 21 inches. Floors and roof are of the pan type slab and joist concrete construction. The exterior walls are reinforced on both the exterior and interior faces, and the interior frame is of reinforced concrete. A total of 89 tons of reinforcement was used in the building, which seems a lot, but is really not more than required for the thick walls which permit the deep reveals of the vertical design motifs.

This building is particularly interesting from an engineering and construction standpoint, since the concrete was placed chiefly during the months of December, January and February. At times the temperature dropped as low as 15 and 16 deg. during concreting, yet, thermometers used constantly for checking showed that the concrete after being placed in the forms had a temperature of 70 deg. There was not a single batch of concrete frozen at any time during the work and the job is as perfect as if it had been

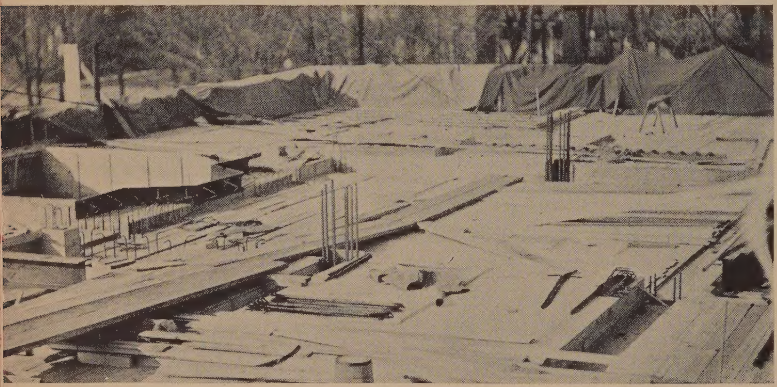
Erecting the plaster waste molds for name of building.



Clock over entrance cast in one large waste mold.



Reinforcement in place for exterior concrete walls.



Newly placed concrete walls were covered with canvas blankets and heated by salamanders.

placed in midsummer under ideal conditions.

A vertical steam boiler was kept in operation day and night to furnish steam circulated through a belt line of pipe placed just outside the forms. This boiler was also used to heat the steam coils which warmed the sand, aggregate and water used in the concrete so that all concrete went into the forms very warm. The forms were cleaned out with a steam jet just before placing concrete, to remove frost from the reinforcement and form lumber. The structure was then enclosed with canvas and the top of each slab covered with straw and canvas as soon as it was placed. A battery of salamanders was kept burning inside the building under the slabs to keep them warm until the concrete had hardened. Tubs of water were placed near the salamanders to maintain the humidity of the air, thus preventing too rapid drying of the concrete.

Several types of forms were used in construction of the building. Flat areas were generally cast in 1x6 lumber forms erected in place. The entire exterior was sandblasted and treated with the Restocrete process giving a pleasing and uniform color to the walls. Reveals and dentils were made by nailing various sizes of boards and wood blocks to form sheathing, producing interesting shadow lines on all facades of the structure. The fluting in the six dominant columns of the front was done by nailing rounded strips to tall panel forms. There was considerable use of plaster waste molds. Both ornamental plaques, balanced in the reveals of both right and left wings of the building, were waste molds built into the lumber forms. The large clock and flagstaff base was formed in one plaster mold, while the scalloped design on either side was made in several pieces. The panel containing the name of the building was also a plaster mold, although the same effect might have been given by nailing wood letters, cut out by bandsaw, to the inner face of the forms.

The quality of all concrete surfaces, both those formed in lumber and plaster molds, are uniformly sharp and even textured. The building, therefore, viewed from any angle, has clean, clear-cut lines and masses.

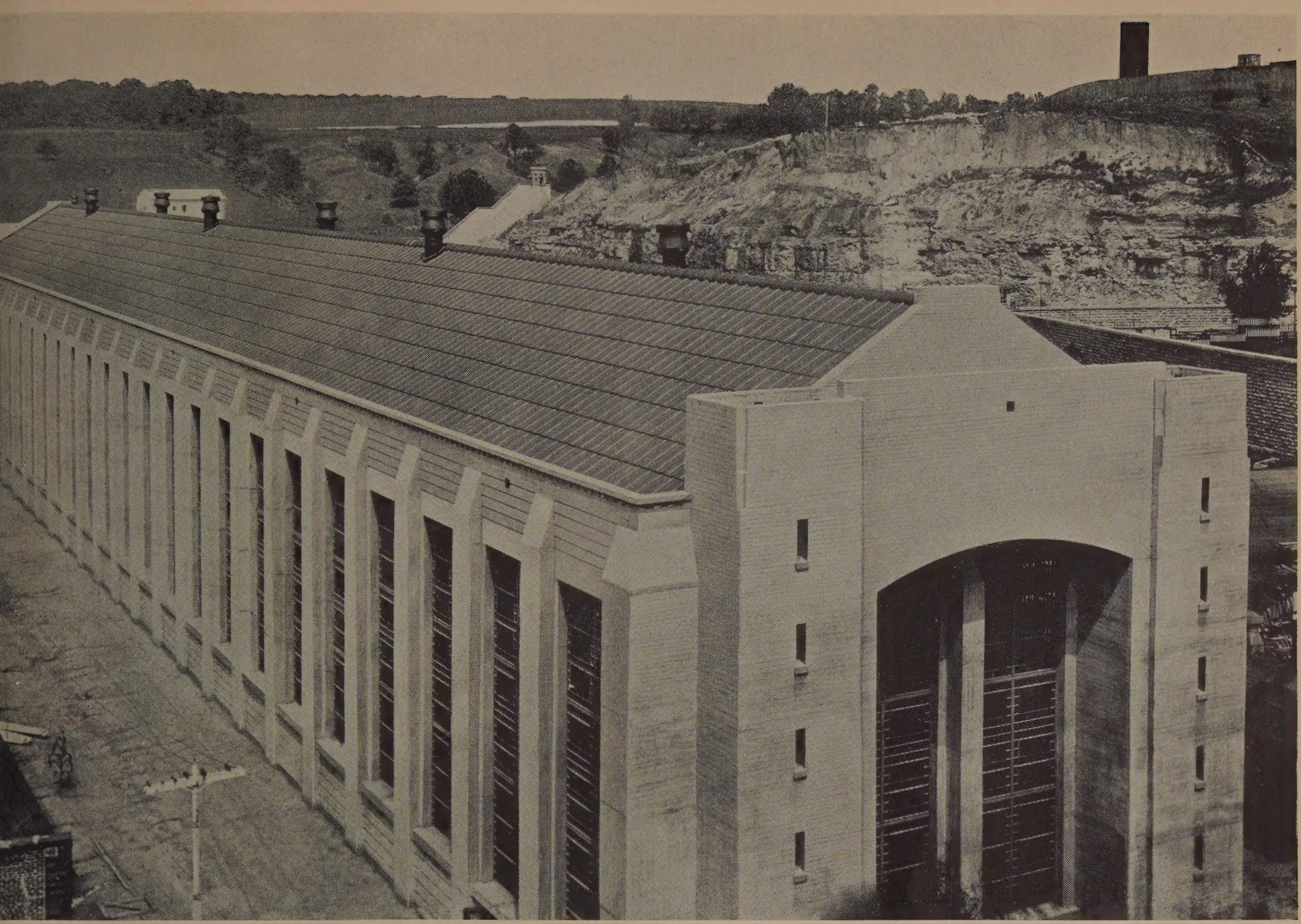
A 4-ft. wainscoting of pink Tennessee marble is used in the first floor lobby, up the main stairway and around the second floor lobby. Floors of vestibule, first and second floor lobbies and all toilets are finished with terrazzo, most of which is made with Italian marble chip aggregate. Other rooms are finished with rubber tile over the concrete floors.

A nurse's office is located in the basement, and a portion of the space there is roughed out as a future juvenile detention unit. The boiler room is at a lower level.

The general contract for the Alpena Court House was $88,252.00. The total cost, including all the trades needed to finish the building and equipment, amounted to $129,817.32. The cube foot cost was therefore about 52 cents.

The court house was built under the direction of Alpena County Board of Supervisors, Raymond J. Bushy, chairman. Mayor John D. Bingham of Alpena was chairman of the building committee, and D. R. Martius, Detroit, was construction superintendent for the committee. Henry C. Weber Construction Co., Bay City, were contractors; Albert Wachner, superintendent. Public Works Administration officials in charge were M. D. Cooley, state engineer for PWA, and Emil Schiebel, project engineer.

The building was officially dedicated October 21, 1935, by Federal Judge Arthur J. Tuttle.



Strength and efficiency mark the design of this new cell house at Menard Branch of Illinois State Penitentiary. Built by prison labor, the building was designed by the office of C. Herrick Hammond, State Supervising Architect.

Illinois' First State-Owned Monolith

By Bryant E. Hadley, A.I.A.*

NEWEST and most modern addition to the Illinois prison system is a monolithic concrete cell house, erected at the Menard Branch of the Illinois Penitentiary during 1930 and 1931. Located one mile from Chester, Ill., overlooking the Mississippi River, Menard Branch prison is situated in a cove surrounded by high rock bluffs, the sides of which have been developed as stone quarries for prison labor. While one might not tastefully call a prison beautiful, a view of the new cell house from atop nearby bluffs reveals an impressive structure—interesting in size, scale and vigorous detail, and certainly interesting as a departure from conventional prison design.

It might even seem beautiful when it is known that it replaced a dark, grubby, stone cell house without windows—a building long overcrowded, unhealthful, and difficult to administrate properly. Preparation of plans, specifications, working details and construction of the new cell house were supervised by the office of C. Herrick Hammond, State Supervising Architect.

Although relief of overcrowded conditions throughout state prisons was the chief purpose of the new cell house, its construction served another very important purpose, that of training prisoners in the arts and trades of building construction; for Menard inmates built the entire structure from footings to roof. They built and erected forms, set up reinforcement, mixed and placed concrete, forged the steel for their own cells, and patiently rubbed the concrete walls to obtain the desired surface texture. From beginning to end, it was a training school in the structural arts, possible

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*Assistant Supervising Architect, State of Illinois.

The five-tier cell block—monolithic concrete with prison steel built in the walls—is clean and well lighted.

because reinforced concrete construction properly directed and supervised can be successfully carried on by labor with relatively little previous training. Under expert direction, Menard prisoners learned much about a very useful vocation.

This cell house is in reality two separate concrete monoliths—one within the other. The outer structure is 64 ft. wide by 410 ft. long. Inside, the cell block is 28 ft. wide and 356 ft. long, built on separate foundations and, with the exception of the ceiling slab, in no way connected with the exterior walls of the building. The cell block comprises five tiers of 100 cells, each housing two men. On each tier the cells are arranged in two rows of 50, placed back-to-back. Floor to ceiling height of the cells is 8 ft.

The concrete ceiling slab, 12 in. thick over the cell block and 7 in. thick from cell block to the outer walls, is for the purpose of preventing prisoners from attempting to escape through the roof. Vents in the ceiling slab aid in controlling temperatures within the house.

Administration problems are constantly studied by the Supervising Architect's Office with a view to improving prison design. The rectangular plan adopted for the building is in line with modern prison experience. A catwalk running the length of each sidewall at a height of 24 ft. makes it possible for guards to observe all five tiers at once. The placing of cells back-to-back with doors facing outward prevents communication among inmates, which often leads to plotting and mischief.

Both the cell house and cell block are designed as monoliths without expansion joints. The stresses in the walls due to shrinkage and variations in temperature are resisted by reinforcement described later which has proved adequate as the building is free from cracks.

Varying foundation conditions—part solid surface rock and part soil—necessitated extending certain portions of the exterior wall to depths of 18 to 20 ft. below grade. Other wall footings are just below the normal frost line.

The piers between windows, chief structural features of the exterior walls, are 2 ft. 8 in. by 5 ft., with curtain walls beneath the windows 8 in. thick. Vertical reinforcement in the piers consisted of twelve 1-in. square bars on the outside and twelve ¾-in. round bars on the inside, tied with ⅜-in. round bars every 9 inches. Other wall reinforcement was ½-in. round bars on 12-in. centers horizontally, and ⅜-in. rounds 18 in. on centers vertically. This reinforcement was placed 2 in. from the outside surface.

All concrete used on the job was proportioned in two four-sack mixers stationed one on each side of the building near the opposite ends. Concrete was proportioned for a specified strength of 3,000 lbs. at 28 days, and never exceeded six gallons of water per sack of cement. All aggregates came from prison quarries, that used for heavy walls passing a 1½-in. sieve, and were uniformly graded from fine to coarse. For thin wall sections, smaller maximum-sized aggregates were used and they were always carefully selected to serve a specific purpose.

Forms for the exterior walls were 1x6 boards made into panels on the ground and lifted into place. While this procedure is the most economical for a building made up largely of piers and openings like this one, it was also necessary, since all work had to be laid out in advance by civilian foremen, and strictly supervised. This could be done much more readily using panel forms than with forms built in place. The sheathing of the panels was driven up sufficiently tight so that a fairly even texture resulted. By carefully raising, aligning and stripping the panels, it was possible to reuse them three or four times.

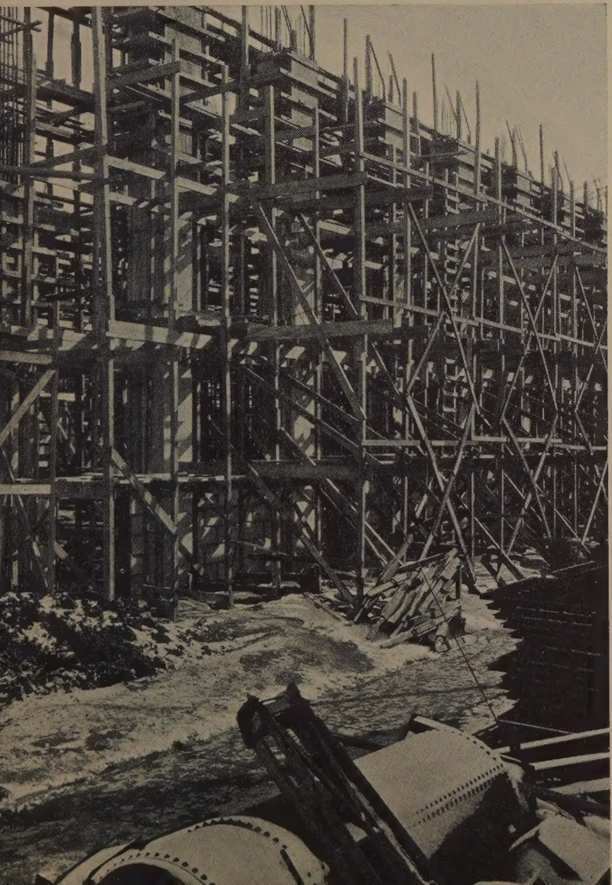
Rustication in the panels beneath windows was made by nailing 2x2 strips against Presdwood-lined forms. All detail elsewhere was cast in unlined forms.

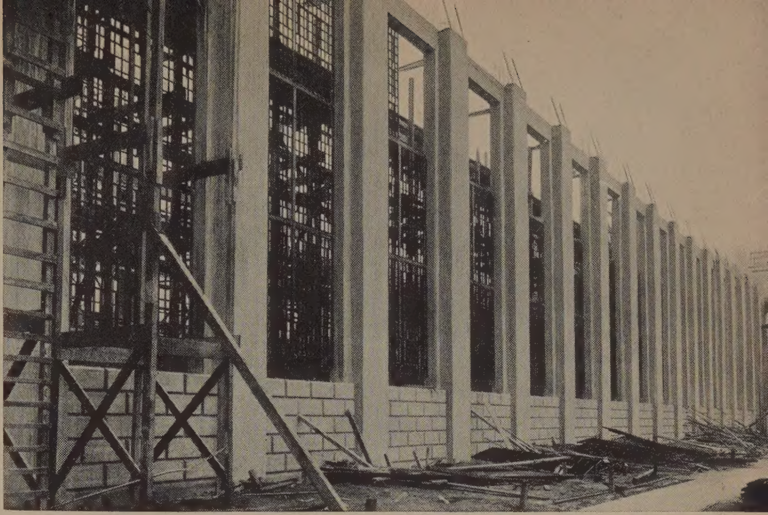
Forms were generally loosened eight to ten days after concrete was placed, but never removed until after ten days or more. The forms held the moisture in the concrete, thus providing good curing and the concrete had time to harden sufficiently so there was no damage to surfaces when the forms were stripped. The walls are very dense and uniform, being diligently puddled by prisoners as the concrete was placed in the heavier wall sections, while vibration was used for compaction of lighter walls.

The cell block is constructed entirely of reinforced concrete, the side and back walls being 5 in. thick. The front cell walls or jambs were increased to 8 in. to receive the metal panels containing cell doors and lock operating devices. The alignment of forms for the front of the cells was a very precise job since it was necessary for a steel rod running the entire length of the block to move freely through sleeves in the doorway of each cell. This long rod, manipulated from one end of the building, locks all cells on a tier at one operation. Not the slightest difficulty that could be attributed to poor alignment has been experienced in the operation of this actuating rod, indicating there has been no unequal foundation settlement nor yielding of the concrete under load.

A 5-ft. corridor runs between the back-to-back cell rows in each tier. It houses the plumbing, ventilating stacks and supply lines, making these installations accessible to maintenance crews, but safely out of the reach of prisoners who like to tinker with such gadgets when they are exposed within cells. Heat for the building comes from a central heating plant through a tunnel built under the floor.

Construction work went on as usual during winter months.





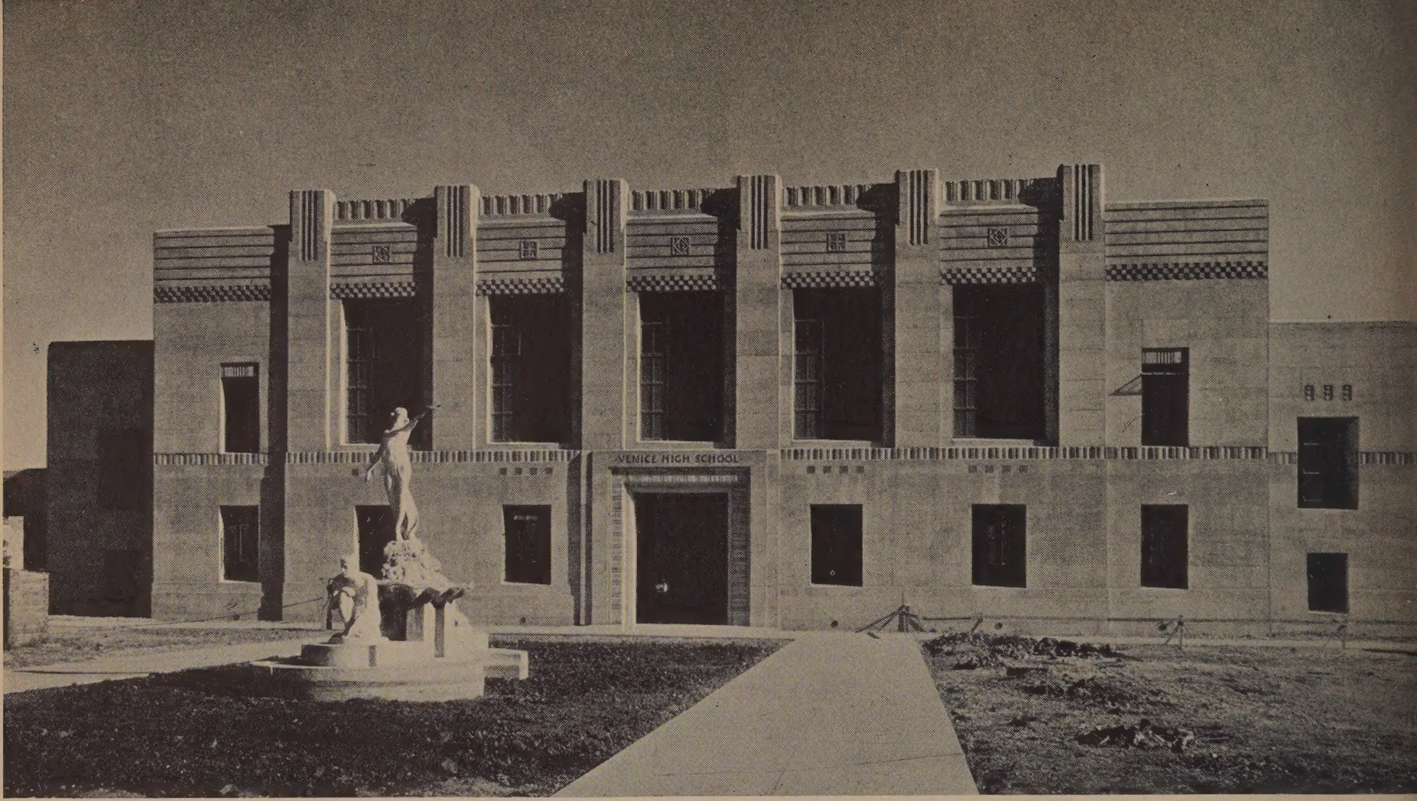
Large, wide pilasters form the chief architectural motif of the exterior. They were cast in panel forms.

All floors in cell house and cell block are concrete, reinforced by ½-in. round rods and wire mesh for temperature reinforcement. Each cell, 6 ft. 7 in. by 10½ ft. has a toilet and lavatory built into the rear concrete walls. Furnished with two iron beds and mattresses of prison manufacture, the cells are quite comfortable and well lighted from the large windows of the cell house walls.

This prison is the first monolithic concrete structure designed, built and owned by the State of Illinois. To undertake its construction with prison labor was a great task, almost unbelievable to one never having to contend with mischievous prisoners who, for malice or for fun, create unforeseen obstacles every step of the way. The work was further handicapped by the fact that prison labor, no matter how plentiful, is never steady. We were lucky to get 5½ hours of work a day. Prisoners, always under heavy guard, had to be called off the job, counted and fed twice daily. On dark or foggy days they were not permitted out of their cells at all, for obvious reasons.

All this adversity was met, however, by ceaseless planning and the close cooperation of a group of civilian foremen who supervised every move of the various operations. Each was in charge of a squad of prisoners assigned to specific tasks. The high quality of the concrete work is due almost entirely to careful and competent supervision by skilled foremen, proving that good work can be done under the most trying circumstances with untrained workmen.

An analysis of costs of the project is very satisfactory. The total cost, including installations, was $439,000. This was 31 cents per cu. ft., or $458.20 per inmate.



Entrance facade of main building of new Venice High School, Venice, Calif. Three structures comprise this beautiful, modern monolith. Austin and Ashley, architects; G. A. Schulte, engineer; Clinton Construction Co., contractors—all of Los Angeles.

Design and Construction of Venice (Calif.) High School

By John C. Austin, F.A.I.A.

THE group of three buildings comprising the new Venice, Calif., High School, was erected to replace several masonry structures damaged during the earthquake of March 13, 1933, and subsequently razed.

In the center of the group is the administration building, connected by concrete arcades with two classroom buildings designated for junior and senior high school use. The latter two are 64x225 ft. each, and the administration building is 81x151 ft. They are all two stories in height with arcade connections at both levels.

The architectural style is modern, character being obtained by plain lines and balanced masses, with a minimum of ornament. The ornament itself is simple and so designed that it could be produced as an integral part of the structural concrete.

Throughout the design the appearance of the exposed structural concrete was a major consideration, and details were studied that would allow removal of forms without destroying exposed edges and corners.

The buildings and arcades are of reinforced concrete, except for stairways, which are of steel. All floors are finished to receive linoleum or soft tile; ceilings are of acoustic plaster on metal lath, suspended from concrete decks. All interior concrete walls are plastered, and partitions are of steel studs covered with metal lath and plaster.

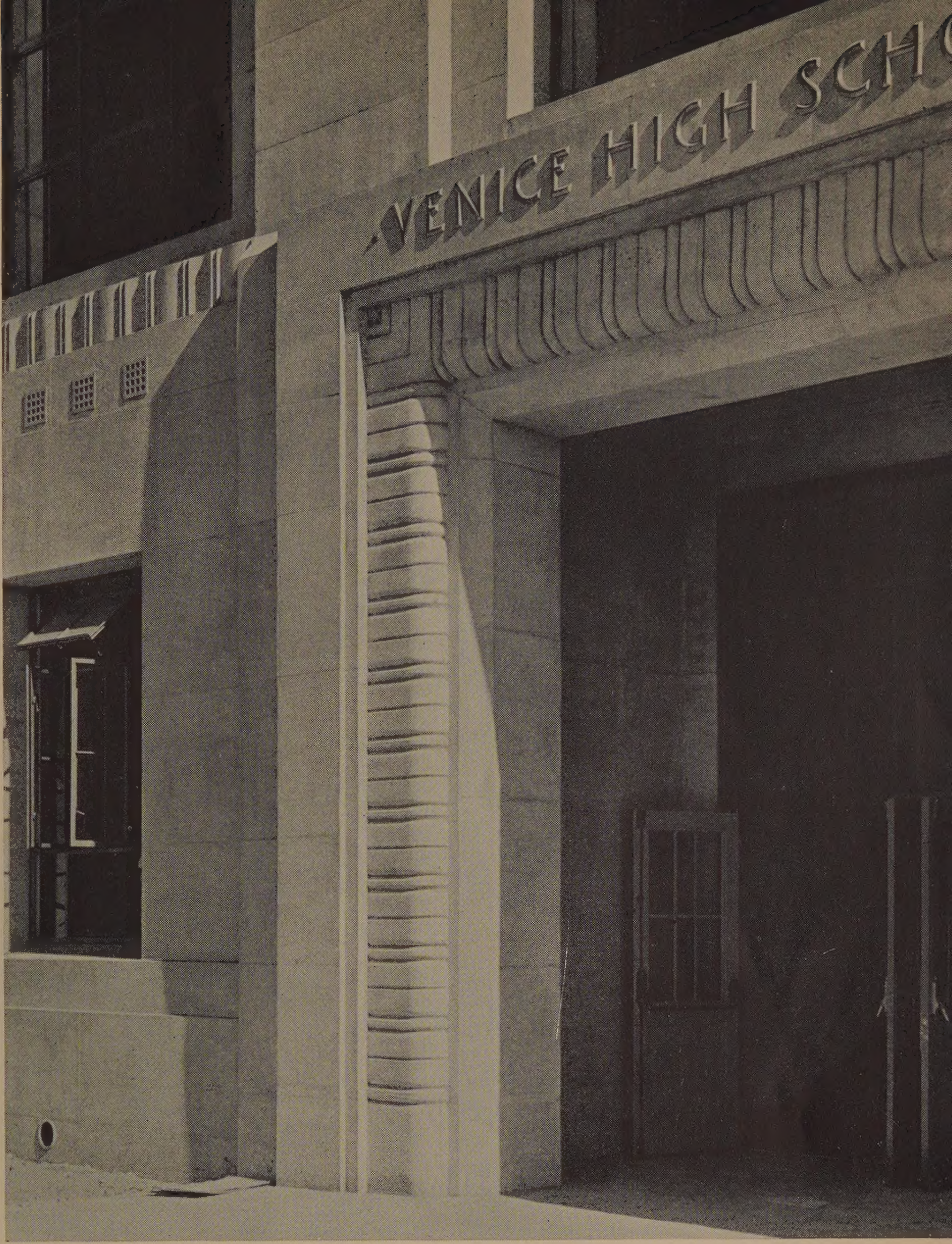
In conformity with state law, the structures are designed to resist lateral forces equivalent to 10 per cent gravity, and plans and computations on this basis were approved by the State Division of Architecture. In the layout of these rectangular buildings, an effort was made to keep the center of the mass and the center of rigidity—in other words, the center of gravity of the resisting elements—as nearly coincidental as possible, to avoid torsional moments.

Lateral forces are transmitted through the floor and roof systems, acting as horizontal diaphragms, to the exterior and interior concrete walls and then to the foundations. Corridor walls and several of the partitions are of concrete, so each building consists of a monolithic enclosure with concrete braces both horizontally and vertically, and longitudinally and transversely.

Due to long spans in the administration building, the floors and roof are solid slabs on longitudinal beams supported on transverse girders. The girders and supporting columns are designed as stiff frames. In the classroom buildings, ribbed slabs are used with diagonal bar reinforcing in the slab to transmit shear stresses to the supporting walls.

Soil tests showed an allowable bearing value of 4 tons per ft. at a depth of 10 ft. below the surface as compared with 1 ton at shallower depths. All the structures, including the arcades, are carried on short caissons with shafts varying from 24 to 30 inches diameter, belled out at the bottom to the required diameter. The tops of the caissons are tied together transversely with reinforced concrete struts placed in trenches excavated at grade. Longitudinally, the exterior and corridor wall beams act as struts. Keys and dowels anchor the structure to the foundation.

The use of concrete as an architectural as well as a structural medium obviously involves consideration of many details.

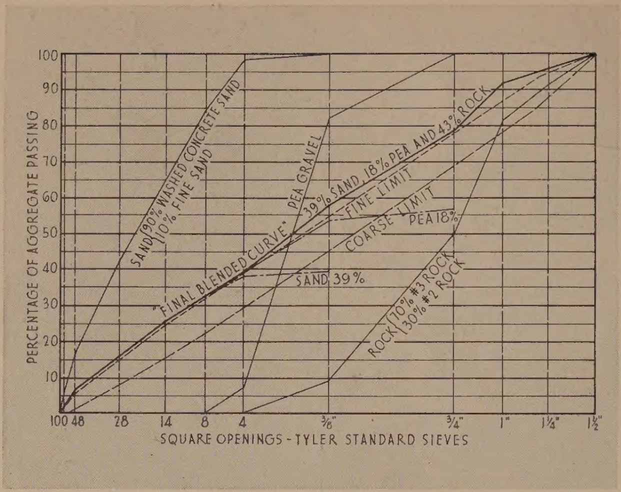


Interesting detail of entrance vestibule was formed in plaster waste molds. Sharp, clean concrete surfaces were the result of good design and careful supervision.

Selection of aggregates, both as to size and soundness, was extremely important. Careful sieve analyses were made of the pit-run aggregates and the necessary corrections were made by the addition of deficient sizes to provide a blended material that would produce a concrete having strength, density and proper workability—each of which is extremely important in work of this type. The blending chart (see cut) shows a certain amount of fine sand and pea gravel added to the $\frac{3}{4}$-in. rock. This produced a curve for the blended aggregate that is reasonably uniform in alignment and very near an ideal mix. In order to follow the designed mix exactly, the quantities of each aggregate for loading the mixer were weighed. The mix was 1:5$\frac{3}{4}$; the average slump was just slightly over 3 in., and the average strength at 28 days was 3245 p.s.i.

It was found that a mix having its aggregates carefully graded required much less water to maintain workability than one not well graded. The use of a small amount of water prevented bleeding and eliminated water run marks or sand streaks on the exterior surfaces.

The placing of concrete so as to produce uniform, clean-cut results requires careful supervision. Concrete hardens appreciably in around 3 hours or less, depending upon the weather and other conditions. If this time is permitted to



elapse between runs of concrete, the construction joints are apt to be quite noticeable unless located where they are inconspicuous. It is, therefore, desirable to place the consecutive layers of concrete not more than 2 hours apart or before any considerable hardening has begun and to thoroughly work the layers together. If the top of each layer of concrete is in a plastic condition when the next layer is deposited, good results will be obtained. Internal and external vibrators were used on the Venice High School project, with good results. Where vibrators are used, the operator should be cautioned to keep the vibrator above the level of the concrete that has commenced to harden. The concrete was distributed by means of buggies and dropped into the walls through chutes placed at mid-height of the wall to prevent the concrete accumulating and hardening on the rustications above the level of the concrete being placed.

When walls are placed the full height of a story in a continuous operation, the water gain from that depth of wall is sufficient to increase the slump some 2 to 3 in., even with a very well designed mix. To overcome this condition and the accompanying discoloration and density variation, the water of the mixture must be decreased considerably in the last 3 ft. of concrete placed.

Plywood was used entirely for exposed exterior flat surfaces. Details were executed in wood when possible; otherwise, plaster waste molds were employed. Particular care was exercised to hold the forms in true alignment. External corners were formed with butt joints and internal corners were mitered. All joints between plywood sheets were buttered with mastic to prevent water leakage, and the forms were thoroughly oiled.

The plywood boards were approximately 30 in. wide and from 4 to 8 ft. long, with horizontal joints in line and the vertical joints staggered.

When the forms were stripped, holes caused by tie rods were filled with grout made of white and gray portland cement and sand proportioned by experiment to match the color of the exposed concrete when dry. This grout was forced into the holes under pressure.

After minor pointing was finished, all concrete surfaces were cleaned with fine grained carborundum stone, and thoroughly washed to remove stains resulting from form oil.

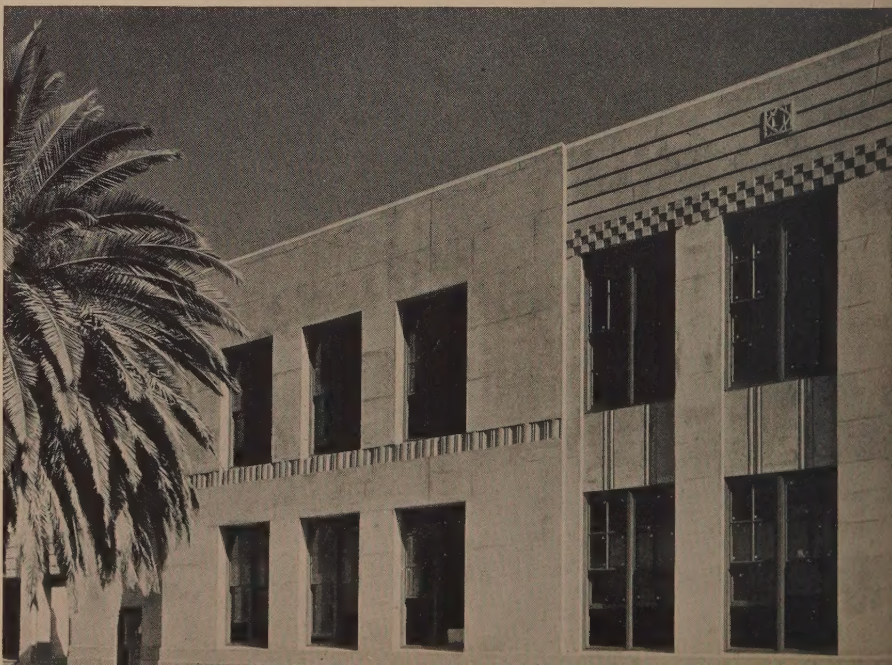
Vertical construction joints through the walls were provided with copper strips 8 in. wide and the full height of the placement; one-half the width of the strip on either side of the joint with a ¾-in. standing seam in the center, allowing for contraction or expansion of the building. Horizontal cold joints were screeded off so that the concrete surface was at least 1½ in. higher on the inside face of the wall, thereby making a simple weather-stop.

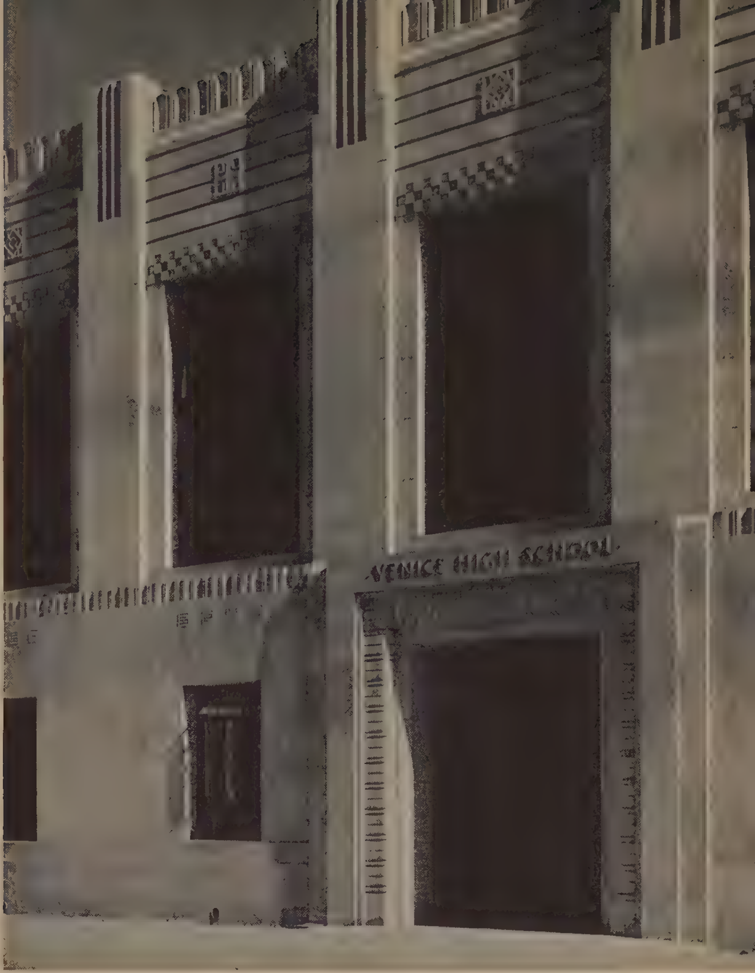
Architectural and engineering plans for the group were prepared in the office of John C. Austin and Frederic M. Ashley, architects, with G. A. Schulte in charge of structural design and Milton W. Nigg, field supervisor.

The Clinton Construction Co., Newell Charde, Manager, were contractors, and cooperated in every way with the architects to achieve the desired results.

Venice High School was built at a contract price of $330,784.51. This cost included all building trades and represented a finished group of buildings at a cost of 19.2 cents per cu. ft.

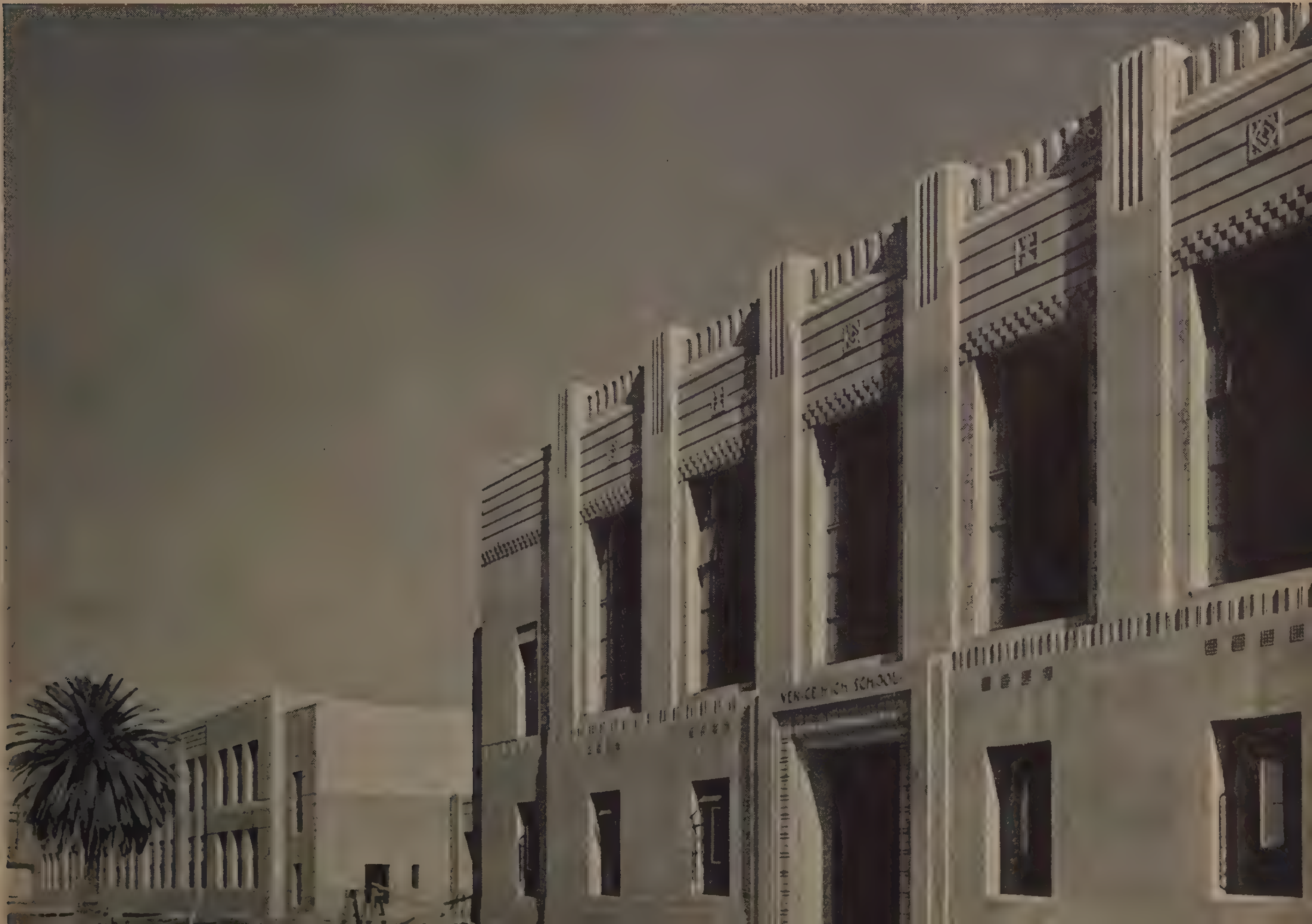
Ornamental detail above the second floor was produced by nailing various sized wooden blocks to the face of the forms.

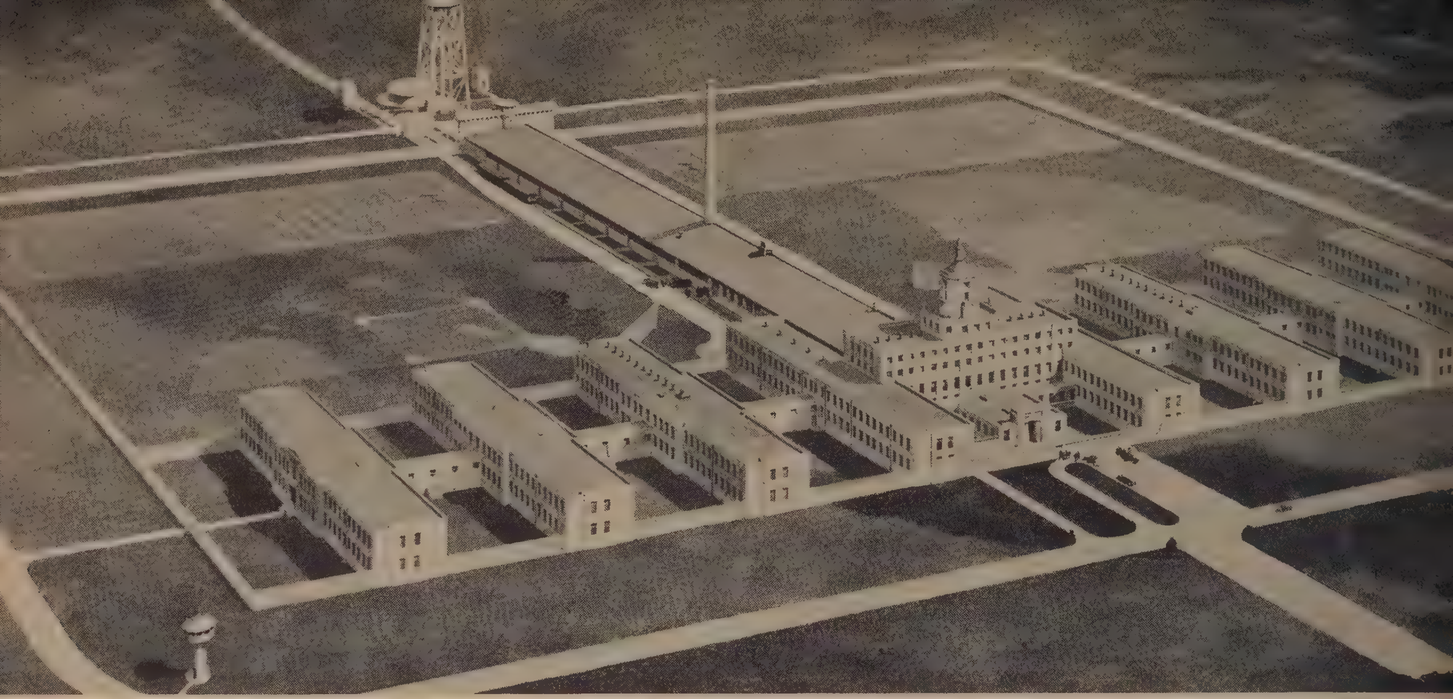




Well executed detail like these modern motifs in the design of Venice High School, require strict alignment of all forms. The flat surfaces were formed in large oiled plywood panels. After minor pointing, all surfaces were cleaned with fine grained carborundum.

Two of the structures comprising the Venice High School group. The architects have avoided monotony by giving each structure distinctive architectural treatment. In general line and balanced mass, however, the buildings reveal their relation to each other.





Perspective of buildings and layout of Georgia's first state-owned prison. Designed for monolithic concrete by Tucker and Howell, Atlanta architects; now being built by Struck Construction Co., Louisville, Ky. Robert Fiske, Atlanta, is the structural engineer.

Progress On Georgia State Prison

By M. P. Nicol*

SOME time next July the first state-owned prison in Georgia will be completed and ready for occupancy. At that time it will be appropriate to tell the whole story of this amazing model penal plant—its novel method of financing as a 15-year leasehold with the federal government as creditor; its self-sufficiency in the production of power, light and water and in treatment and disposal of sewage; its complete segregation of white and negro prisoners including separate prison yards and athletic fields; its further separation of various classes of criminals so that hardened veterans can never come in contact with youngsters; and its self-supporting farm and workshop facilities.

At present it will be sufficient to report the progress we have made in the execution of the fine design planned by Messrs. Tucker and Howell, architects.

As the accompanying perspective indicates, the project comprises eleven units: a six-story administration building; four two-story cell units for whites (left of sketch) and four for negroes (right); a long row of shops extending 700 ft. back from administration building; and the water supply system at the rear. The units on either side of the main building are 242x42 ft. spaced 60 ft. apart and connected by a concrete passageway.

Since ground was broken April 1, 1935, all concreting has been finished on units A, B and C (left of rendering). This includes monolithic concrete walls, partitions, floors and slab roofs. At this rate all concrete work on the rest of the units should be finished well within scheduled time.

Before bids were called for, the architects analyzed the costs of competitive materials and found monolithic concrete considerably more economical. In addition to lower costs, concrete construction offered the further advantage of maximum security against escapes.

As it developed, actual bid prices showed concrete to be 15 per cent lower than the nearest competitive material. The general contract totaled $1,083,000 and the prison work contract amounted to $198,980. The total cost is,

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*President, Struck Construction Company.

therefore, $1,281,980 or 31 cents per cu. ft.—a very low figure for such a huge layout with the varied facilities for 2,000 inmates.

The concrete has a smooth surface. The method of obtaining this texture is one of the interesting problems of the job. The walls are formed against plywood panels. After removal of the forms, small air and water pockets are filled by a thin cement grout brushed over all surfaces and immediately scraped off with the edge of a steel trowel. Then, after about two hours' time, the surfaces are rubbed lightly with dry burlap. This operation removes all traces of cement that might have been left by the troweling operation and produces the effect desired. The exposed concrete will finally be given an application of white paint on the outside and light green paint on the inside.

Exterior monolithic concrete walls are 8 in. thick in all buildings except certain walls of the administration unit where they are 12 in. thick. Spandrels in these walls, however, are 8 in. thick.

The concrete mix used throughout the structure approximates 1:2$\frac{1}{2}$:4, and is proportioned by weight. Maximum water content is 7$\frac{1}{2}$ gal. per sack cement. Batches are about 19 cu. ft., mixed for one minute after all materials are placed in the mixer. Spud internal vibrators are used for compaction.

Close control of all concrete is obtained by a central mixing plant set up near the center of the project. Removable hoppers on trucks carry the concrete from plant to place of deposit. An angle iron frame holds the hoppers in place on the bed of the truck while it is in motion, and top connections allow for a quick crane pick-up. The unloading cranes are stationed where the concreting is being done and as the hoppers are swung over the forms, it is necessary only to release a bottom dump-gate to deposit the mix in exact position.

Forms consist of story-high panels which extend from the center of one tier of windows to the center of the next. In this way there is only a short vertical joint line beneath each window and the horizontal joints come at the window heads and at the floor levels. The panels are made of $\frac{5}{8}$-in. plywood backed with 2x4 studs on 12-in. centers. Full width sheets of plywood extend from window jamb to window jamb. The panels are held in position by walers composed of two 2x4's spaced 2 ft. apart.

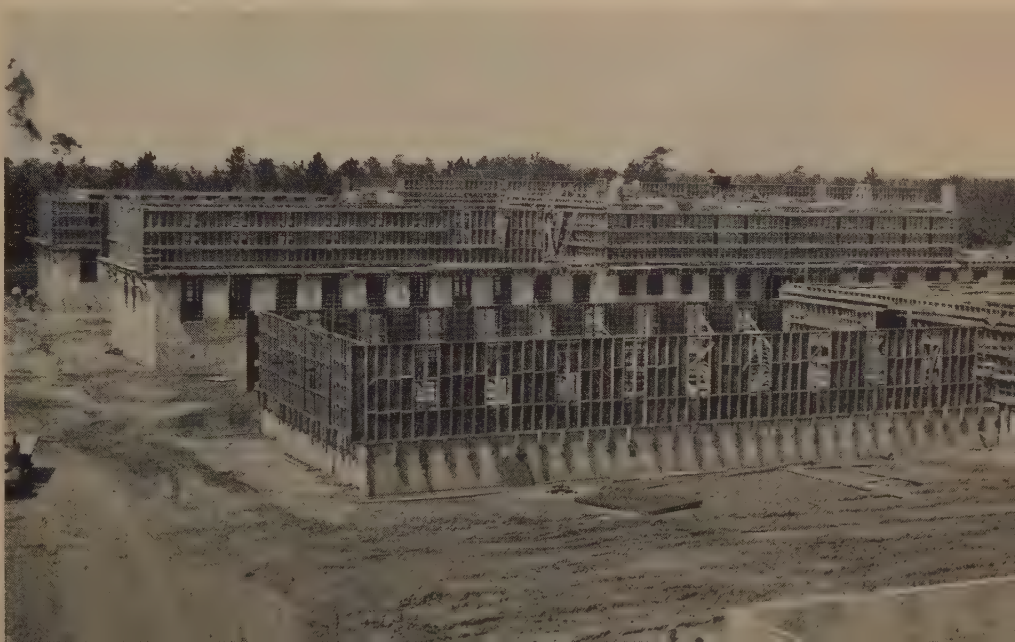
The precast concrete spacers we have used are much more satisfactory than the usual wood blocks. The concrete spacers are left in the walls whereas considerable time is lost in keeping wood blocks in position and in retrieving them as the concrete is placed. Form ties are of the removable type, consisting of $\frac{3}{4}$-in. steel rods, threaded to screw in and out of an insert which remains in the wall well back from the surface so there is no danger of corrosion.

At the main entrance there is to be an interesting sculptured panel depicting the purpose of the institution as a means of rebuilding character. This panel will be cast in plaster waste molds. The model is being made by an Atlanta sculptor, Julian H. Harris.

Steel windows and doors are used throughout, embedded in the concrete as the walls are placed.

The accompanying illustration reveals the extent of the work at the present time and the manner in which it is being done. Further problems may arise in some of the other buildings but, in the main, construction will be very similar to that already described. By the middle of next summer the architects, Tucker and Howell, the people of the state of Georgia and the contractors should be able to point with pride to the most modern, splendidly equipped state penitentiary in any American commonwealth.

No muss and fuss attend the work of forming the walls of Georgia's new prison. Materials and equipment are kept away from the job until ready for use. Walls are placed in large panel forms, lifted from story to story.



Flower Mission Hospital

By J. Edwin Kopf, Architect

USE of concrete as an architectural material has long been an accepted and successful practice in certain regions, particularly the West Coast. In the Middlewest, however, there are as yet few structures in which concrete is exposed, although the backbones of many of our buildings for years have been reinforced concrete frames. When it has been possible to depart from tradition, architectural concrete has been used here with interesting results which foretell a future for the material as brilliant as past experiences in California, Europe and Japan.

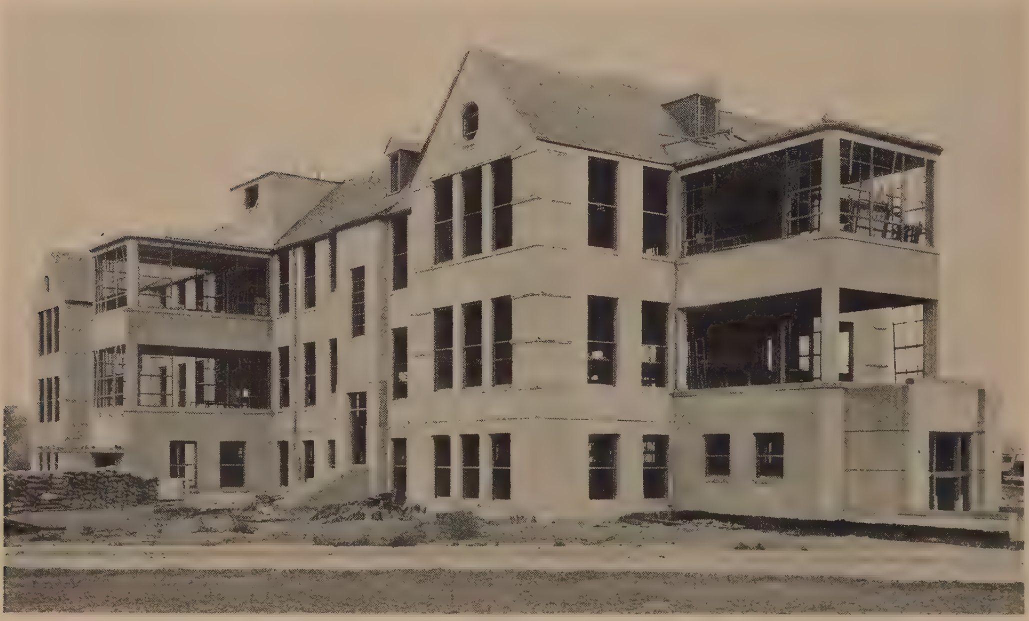
The design and construction of Flower Mission Memorial Building, newest addition to the facilities of Indianapolis City Hospital, presented an excellent opportunity to use architectural concrete in a small but very important manner. The building is a combination of monolithic concrete and buff-colored pressed brick. Concrete portions of the structure are the base course around the entire building, the entrance to the dispensary, and the three solaria designed for sun and air treatment. The combination of concrete and brick produces a pleasing contrast.

Concrete for the entire structure, including the reinforced concrete frame and the exposed architectural concrete, was specified for a strength of 3,000 pounds. Exposed surfaces were cast against large panels of ¾-in. plywood used as form lining. The concrete, supplied by the Ready Mixed Concrete Corp., was compacted by the use of vibrators applied to both the outside and inside forms during placement.

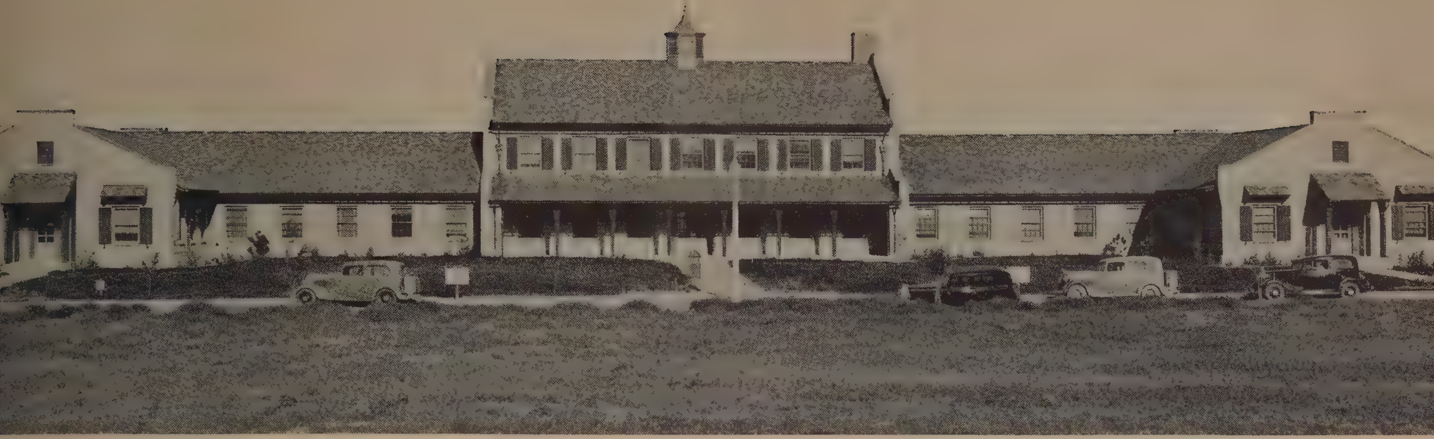
While the building is not entirely architectural concrete, enough of it has been used to produce the effect desired and to win much favorable comment from those who have inspected the job since the forms were stripped.

Now nearing completion, this hospital unit will provide 100 beds for the care of advanced cases of tuberculosis, and also space for a dispensary and clinic for the poor. The building is named for the Indianapolis Flower Mission, a group of public-minded women who for years have worked to relieve tuberculosis sufferers. The Flower Mission financed part of the construction by means of a public subscription; other moneys came from the Snow Memorial Fund and from PWA. The total cost of building and equipment will be in the neighborhood of $180,000.

As a hospital structure and as an example of the combination of building materials in which concrete is used frankly as an exposed architectural medium, it is a highly satisfactory project.



Flower Mission Hospital, Indianapolis; base course and solaria are monolithic concrete, the rest brick over reinforced concrete frame. Kopf and Deery, architects; Service Construction Co., contractors.



Permanently housing the staff of engineers and technicians on the Fort Peck Dam project is this fine, new monolithic concrete administration building. Designed by U. S. Engineer's Office, Kansas City; built by Johnson, Drake and Piper, contractors.

Administration Building—Fort Peck

By M. H. Linscott, Architect

ONE of the important jobs in preparation for the construction of Fort Peck Dam at Fort Peck, Montana, was the erection of a large office building for the administrative staff working on the project. The structure, completed in the fall of 1934, is monolithic concrete and will be a permanent part of the project. The main portion of the building is on the ground level with a second floor over the central unit and a basement extending under the entire structure.

Fort Peck is located in one of the coldest spots in the United States where the temperature may drop to −50 deg. F. However, realizing that dams, bridges and other engineering structures have long been in use in such severe climate and under even more adverse conditions of exposure than that to which a building is subjected, there was every reason to adopt monolithic concrete construction for the Fort Peck administrative building.

The exterior walls are 10 in. thick, exclusive of the furring, and the concrete is waterproofed on the inside. Furring the walls was necessary to prevent condensation, the furring consisting of nominal 2x2-in. strips to which was attached a 1-inch blanket type insulation with 1x2-in. grounds. Metal lath was placed over the grounds to receive a sand finished plaster.

Both faces of the walls were reinforced both ways with deformed bars to resist shrinkage and contraction and expansion due to a range of temperature from −50 deg. F. to +110 deg. F. The outside face was reinforced more heavily than the inside. One-half-inch round bars, 12-in. centers vertically and 8-in. centers horizontally were used on the outside and ⅜-in. round bars at the same spacing on the inside. This amount of reinforcing appears to have been adequate, as the building passed through a hot summer and the extremely cold weather last winter without a trace of surface cracking.

Texture of the outside walls is in harmony with the setting of the building. Forms made of 1x6 T. and G. boards chamfered at the edges, accent the horizontal joint lines. Gable ends of the building have parapet walls extending above the roof covered with a brick coping. Copper flashing extends entirely through the wall under the brick coping and down to the roof.

Floors throughout are concrete, joist and slab construction, with 1-in. monolithic floor finish covered with asphaltic composition tiles. Ceilings are constructed similarly, and are insulated with 2-in. blanket insulation cemented to the attic slab. The interior partitions are of gypsum block, plastered on both sides.

The roof is made of flat shingle tiles, red in color, laid over T. and G. sheathing supported on wood rafters. Rafters are rigidly braced by collar beams and vertical supports attached to the concrete attic slab.

Windows are wood, double-hung with spring counter balances. All wood used on the exterior is rough sawed and stained dark brown in color. At present the building is heated by a forced air system, zone controlled. Provision is made for installation of air conditioning, if required.

Design of the Administration Building and other structures connected with the project was made in the United States Engineer's office in Kansas City. Construction work on the Administration Building was carried out by Johnson, Drake and Piper Co., contractors, Minneapolis.

Architectural CONCRETE

ARCHITECT · ENGINEER · CONTRACTOR

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Pioneering was the pleasant solution for Alpena County's court house problem, says William H. Kuni (page 3) . . . Bryant E. Hadley describes (page 5) Illinois' newest "big house" . . . John C. Austin comes back (page 8) with more data on concrete design and construction . . . M. P. Nicol is pleased with progress (page 12) made on the construction of Georgia's first state-owned prison . . . A special use of architectural concrete (page 14) is related by J. Edwin Kopf . . . M. H. Linscott tells about a concrete building (page 15) in one of the coldest spots in the U. S., by a dam site . . . Charles H. Schwertner and H. C. Wildman relate two different methods of using cast stone as forms for monolithic concrete walls (pages 17 to 20)—for your A.I.A. files . . . . In old Carolina they like Colonial, and D. L. Chaney says (page 21) that's what they are getting on Columbia federal court house . . . Unless everything turns for the worse, Atlanta's new jail will be adequate for years, is the opinion (page 25) of Preston S. Stevens . . . San Francisco's new "cooler" is a fooler—it does not depress Homer M. Hadley who looks at it (page 28) from the outside . . . William J. J. Chase's two modern jails replace (page 30) a couple of old fashioned "jugs" . . . Will G. Corlett encountered interesting design problems (page 32) on Palo Alto Hospital . . . Jno. M. Marriott is convinced (page 34) that reinforced concrete was most economical for Fort Sam Houston post prison.

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Notes and Asides

THINGS scorned because they are new often have the ironical fate of becoming indispensable 25 years later. People who avoided the first railway train because they thought they would not be able to breathe at 12 miles an hour, rushed impatiently from coast to coast at 50 miles an hour before they died of old age. The automobile which "never would be practical because it frightened horses," rarely encountered a horse at the end of one generation.

When concrete was first proposed for use as an architectural medium, the material held the status of a mule hide in an ermine shop. It was difficult to imagine a crude structural material elevated to the position of an artistic medium. But knowledge and understanding change things; and things, when they are used properly, change life itself. Thus, concrete became within a few years the No. 1 architectural material of the regions in which it was developed. Then it spread elsewhere, steadily increasing until in 1934 and 1935—not such flush years in the building industry—more architectural concrete buildings were erected east of the Rockies than ever before.

Concrete is long past the stage where working in it is pure adventure. But its spread into new fields is still real adventure, giving architects who have never used it before new thrills and a new sense of freedom in design.

• •

One of the most interesting current trends is toward good looking jails. For years, it seems, jails and prisons have been purposely ugly buildings, designed with the idea that a bad place to be, should look the part. But whatever it takes to impress upon malefactors that crime does not pay, can certainly be arranged within the walls of a good looking building. This world is sad enough without the constant reminder, in the form of a gloomy Old Bailey, that every community has its colony of crooks and villains cooped up to keep them out of mischief. When jails look more like other public buildings than Bastiles, our towns and cities will begin to look their civilized age.

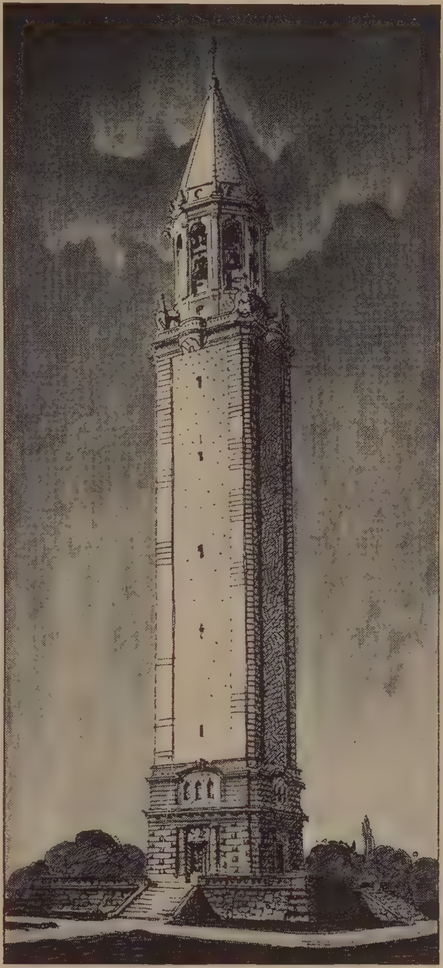
CAST STONE COMBINED AS FORMS AND FINISH FOR MONOLITHIC CONCRETE WALLS

Nemours Carillon Tower

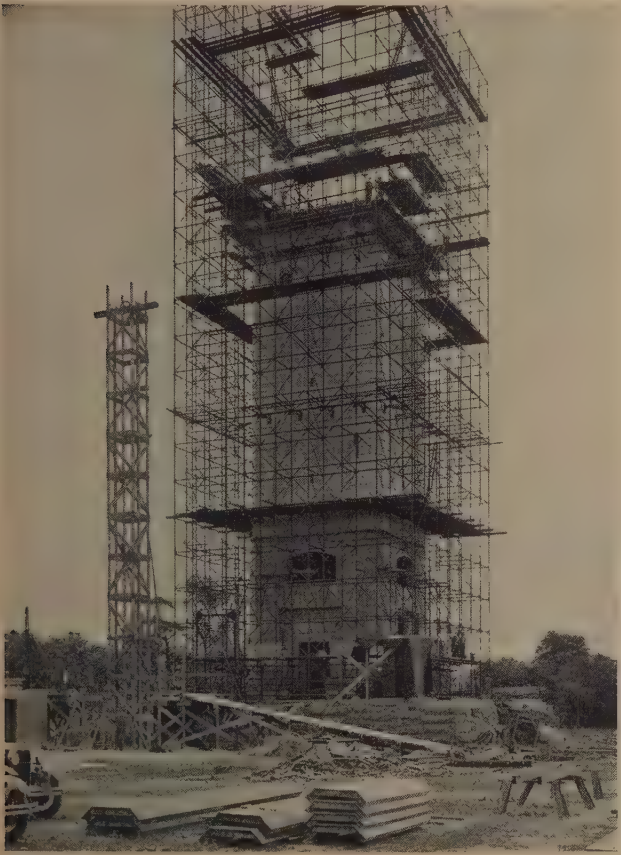
By Charles H. Schwertner*

NEMOURS Carillon Tower, on the estate of the late Alfred I. du Pont near Wilmington, Del., is a reinforced concrete shaft 210 ft. high and 26 ft. 6 in. square at the terrace level, tapering to 25 ft. 10 in. at the balcony level. Below the cornice at the first floor level it is faced with gray Vermont granite. Above this point the exterior is cast stone, the panels of the shaft being pink, while the corners and the spire are gray cast stone closely resembling the color and texture of the base course granite. All the cast stone has a bush hammered finish.

One of the unusual features of this structure is the use of the cast stone facing as the outside form for the concrete walls of the tower. All outside wood forming was eliminated and dependence placed on the cast stone slabs to support the freshly placed concrete. The cast stone, testing over 9,000 pounds p.s.i., was made in units about 4 ft. high, 8 ft. long and generally 5 in. thick. The pieces have about 28 sq. ft. of surface and weigh 1,800 pounds. These units were designed as vertical slabs, reinforced to withstand a 4-ft. depth of concrete placed in 1 hour. Loops of ½-in. round iron bars (Figs. 1 and 3) were molded into the cast stone to provide a means of fastening it to the inside wall form which was erected first, the loops also serving as permanent anchorage for the stone. An accurately dressed shoulder (Figs. 1 and 5) was provided at the horizontal joints as a means of keeping the exterior faces of the successive courses flush and in proper alignment.



NEMOURS CARILLON TOWER, WILMINGTON, DEL.; MASSENA AND DU PONT, ARCHITECTS.



THE SCAFFOLDING USED IN ERECTION OF NEMOURS TOWER WAS THE SAME ONE USED RECENTLY IN CLEANING AND REPAIRING THE WASHINGTON MONUMENT. PROGRESS OF TOWER CONSTRUCTION HAS BEEN AHEAD OF SCHEDULE.

Since the exterior of the tower is designed to simulate coursed ashlar in units 16x36 in., while the cast stone was made in large slabs, three courses high with false joints, it was necessary to devise a method of eliminating straight vertical joints between cast stone slabs. This problem was solved by casting the slabs in the shape shown in Fig. 2. Slabs at the sides of the windows were made with stepped vertical joints (Fig. 3) and individual units were made to fill in. These insert stones were anchored by means of threaded bolts molded in the cast stone and fastened to the channel irons shown in Fig. 6.

A steel scaffold entirely surrounding the tower was built well above the level at which construction was going on. A scaffold is necessary in this type of construction, since the cast stone facing is actually erected in advance of the supporting walls. In this particular project, the scaffolding

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*Sauter and Schwertner, Contractors, Philadelphia.

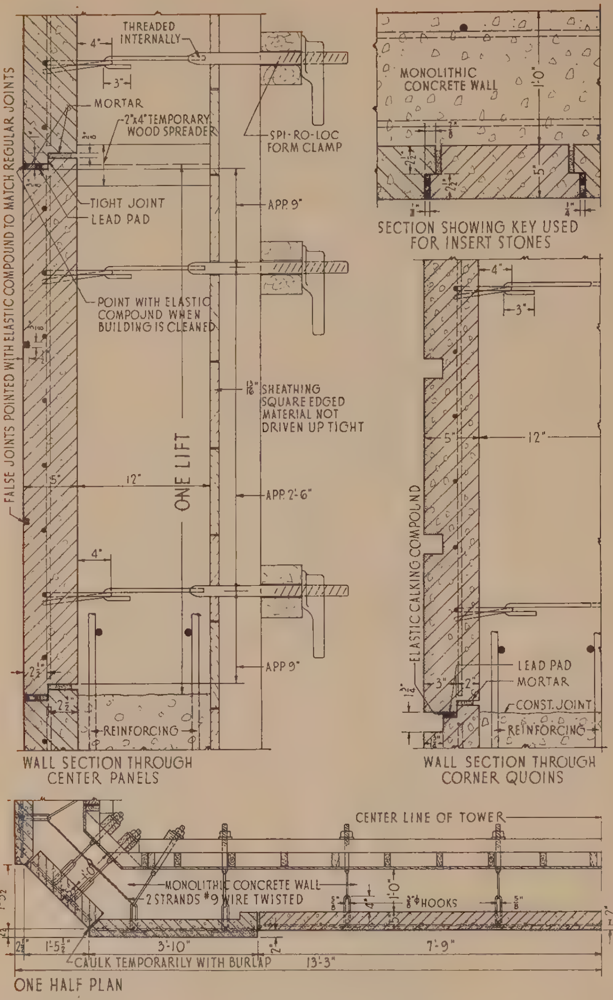

THREADED INTERNALLY
4"
3"
MORTAR
2"x4" TEMPORARY WOOD SPREADER
SPI-RO-LOC FORM CLAMP
TIGHT JOINT
LEAD PAD
APP. 9"
POINT WITH ELASTIC COMPOUND WHEN BUILDING IS CLEANED
FALSE JOINTS POINTED WITH ELASTIC COMPOUND TO MATCH REGULAR JOINTS
13/16" SHEATHING SQUARE EDGED MATERIAL NOT DRIVEN UP TIGHT
ONE LIFT
5"
12"
APP. 2'-6"
4"
APP 9"
2 3/4"
REINFORCING
WALL SECTION THROUGH CENTER PANELS
MONOLITHIC CONCRETE WALL
1'-0"
SECTION SHOWING KEY USED FOR INSERT STONES
ELASTIC CALKING COMPOUND
12"
LEAD PAD
MORTAR
CONST. JOINT
REINFORCING
WALL SECTION THROUGH CORNER QUOINS
CENTER LINE OF TOWER
MONOLITHIC CONCRETE WALL
2 STRANDS #9 WIRE TWISTED
3/8" φ HOOKS
1'-5 1/2"
3'-10"
7'-9"
13'-3"
CAULK TEMPORARILY WITH BURLAP
ONE HALF PLAN

Fig. 1

served as a convenient storage place for material as well as a working platform.

Under the method of construction followed, the inside wall forms were built and braced in the usual manner with the exception that small openings were left between form boards to permit the escape of any excess water that might be worked out of the concrete while it was being placed. Fig. 4 is a view of the inside form showing the arrangement of bracing and the form clamps used to draw the cast stone facing into line.

The cast stone was set one course at a time on a horizontal mortar bed. The joints were spaced with lead pads. By means of form clamps (Figs. 1 and 4) the slabs were drawn tightly against the shoulder on the pieces below and against temporary wood spreaders set along the inside top edge. No attempt was made to introduce mortar into the vertical joints at the time of setting. Burlap was caulked into these joints on the outside and removed after the reinforced concrete had hardened. The joints were then inspected and a stiff mortar was tamped into any which had not been filled by grout from the concrete. All joints will be pointed with an elastic compound to a depth of 1 in. when the construction is finished.

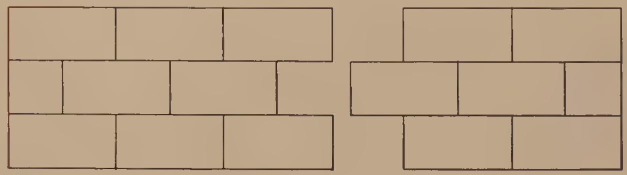


Fig. 2

Cast stone was erected and the wall concrete placed one course at a time. Five courses, constituting 1 story, were usually completed in eleven working days, four of which were consumed in building interior forms and seven in setting the stone and placing concrete in walls and floor. Concrete in the first four lifts in each story height was placed by means of a closed metal chute passing from the floor above through holes left in the inside form of each wall. Concrete in the floor slab was placed simultaneously with that in the top course.

Methods used in executing this system of construction were decided upon as being the most satisfactory after various other schemes were tried. After the workmen became accustomed to the procedure, which was after 3

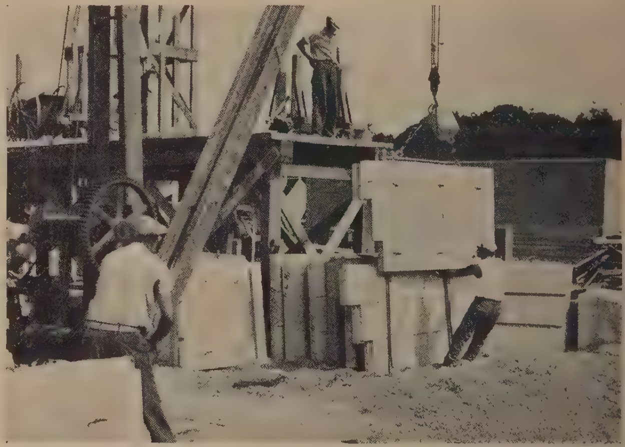


Fig. 3

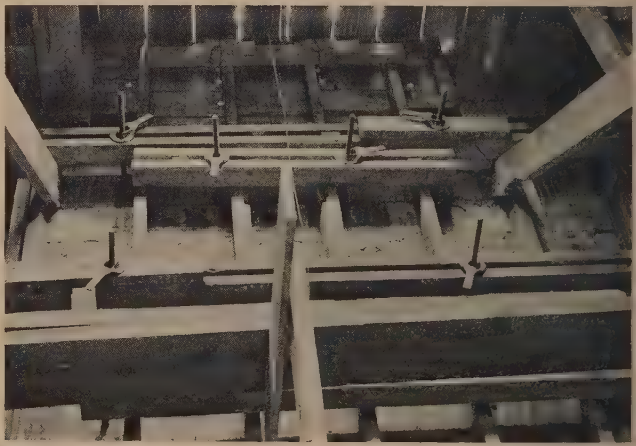


Fig. 4

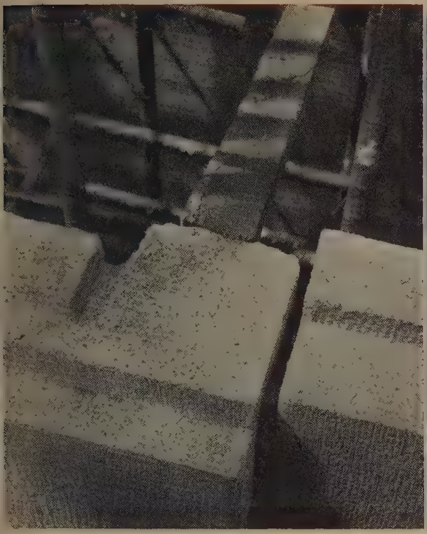


Fig. 5

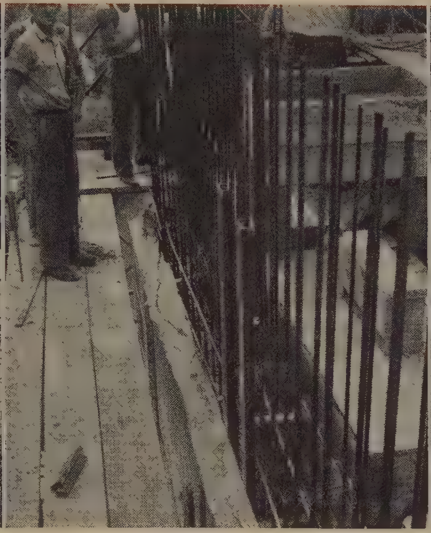


Fig. 6

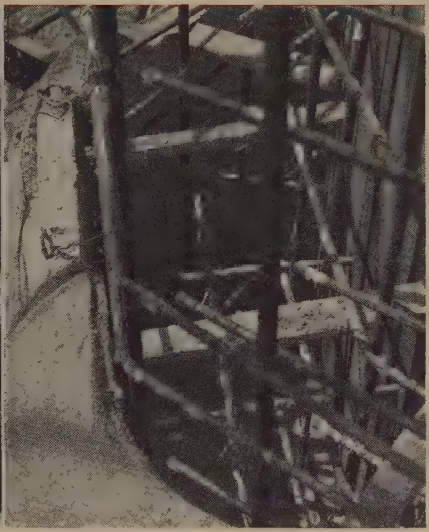
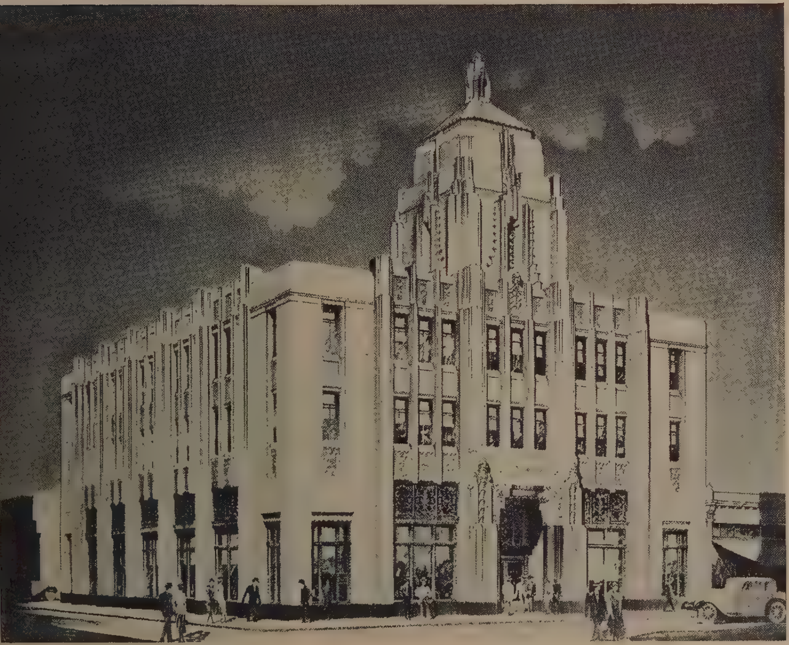


Fig. 7

or 4 courses of cast stone were erected, no difficulty whatsoever was encountered. In fact, the work was accomplished with so little trouble that the spire is to be built by this same system although it was at first intended to construct only the shaft in this manner and to set the remainder of the cast stone in the orthodox way. This decision was reached because of the economy and speed we have found in this method of construction and the more positive anchorage obtained between the structural walls and the facing.

The unexpected rapidity with which the work can be carried on is indicated by the fact that when construction reached that portion of the tower where cast stone was used as forms, we were 35 working days behind the original schedule. This time was made up and an additional three days gained by the time construction had reached the balcony level at the bottom of the spire.

Santa Ana City Hall

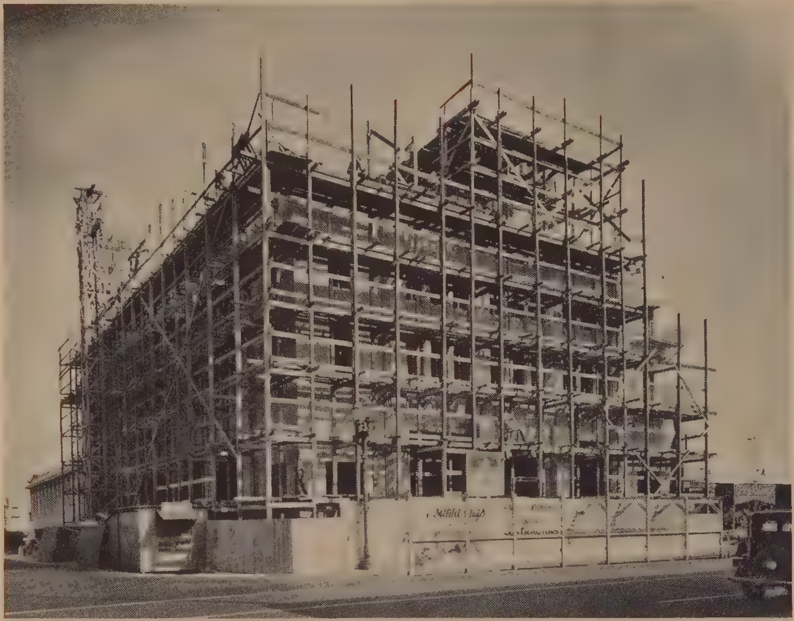


CITY HALL, SANTA ANA, CALIF., NOW UNDER CONSTRUCTION. THIS COMBINATION CAST STONE AND MONOLITHIC CONCRETE BUILDING WAS DESIGNED BY AUSTIN AND WILDMAN, ARCHITECTS. BALL AND HONER ARE THE CONTRACTORS.

By H. C. Wildman, Architect

SANTA ANA City Hall is a three-story, mezzanine and full basement structure. The frame and walls are reinforced concrete, the two street elevations being faced with cast stone of a pinkish gray color. The physical quality of the cast stone is unusually high due to the use of carefully selected aggregate and mechanical vibration in its manufacture.

The cast stone cannot be classified as an applique or veneer, because it is first set and then the concrete placed using the well-anchored stone as the outside form. Under the procedure followed on this particular job, the inside wall and floor forms are built according to usual practice. The cast stone units, approximately 24 in. high and 38 in. long, are then set one course high with a full bed of mortar in horizontal and vertical joints. The exterior face of the cast stone is kept flush and plumb by means of studs which are held by wire



SCAFFOLDING OBSCURES THE BEAUTY OF NEW SANTA ANA CITY HALL NOW NEARING COMPLETION.

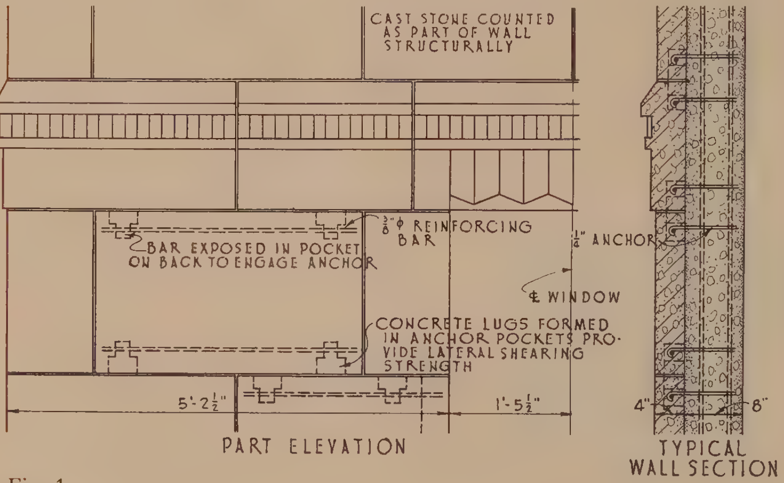

CAST STONE COUNTED AS PART OF WALL STRUCTURALLY
3/8" φ REINFORCING BAR
BAR EXPOSED IN POCKET ON BACK TO ENGAGE ANCHOR
1/4" ANCHOR
℄ WINDOW
CONCRETE LUGS FORMED IN ANCHOR POCKETS PROVIDE LATERAL SHEARING STRENGTH
5'-2 1/2"
1'-5 1/2"
4"
8"
PART ELEVATION
TYPICAL WALL SECTION

Fig. 1

loops passing through the stone joints, drawn tight with wedges on the back of the inside form (Fig. 2). These tie wires are clipped and pulled out from the inside as soon as the concrete hardens.

Each unit of cast stone is anchored to the concrete with a ¼-in. hooked rod at each corner engaging ⅜-in. reinforcing bars molded in the cast stone and exposed in anchor pockets as shown in Fig. 1. Further bonding between the cast stone and the concrete is obtained by concrete lugs formed in the anchor recesses and by the mechanical key provided by the roughened back of the cast stone.

Before the concrete is placed, the joints are plastered quite thickly with cement mortar and then an emulsified asphalt is applied to the entire surface, the joints being coated heavily and the back of the stone lightly. This method of waterproofing the joints has been successful in holding moisture in the concrete.

Many questions have been asked and theories advanced regarding this type of construction. These methods have been used by our office in four different buildings and in none of them has a trace of efflorescence or staining ever appeared on the surface of the cast stone. Where the stone was anchored in this manner, it has withstood earthquake action without cracking, spalling at the joints or loosening from anchorage. There is no doubt that the falling of stone veneer from buildings during the period of an earthquake has caused clients to shy at the use of such material. However, it is our experience that with care cast stone and monolithic concrete may be used together and the result will be a very safe and pleasing finish for buildings with concrete walls.

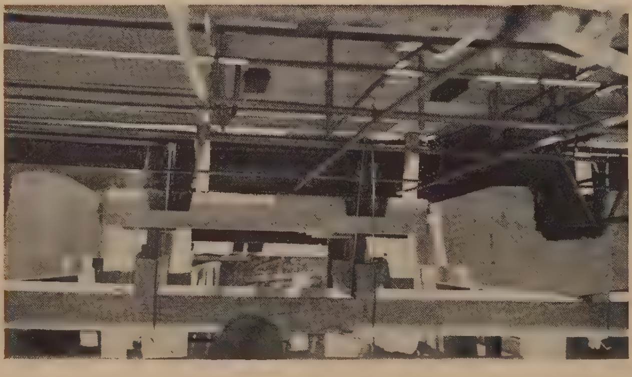


Fig. 2

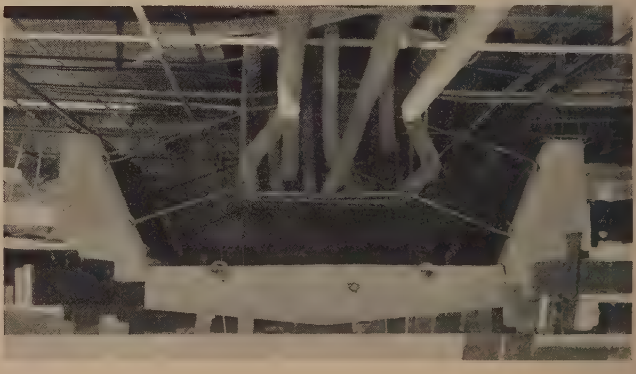


Fig.3

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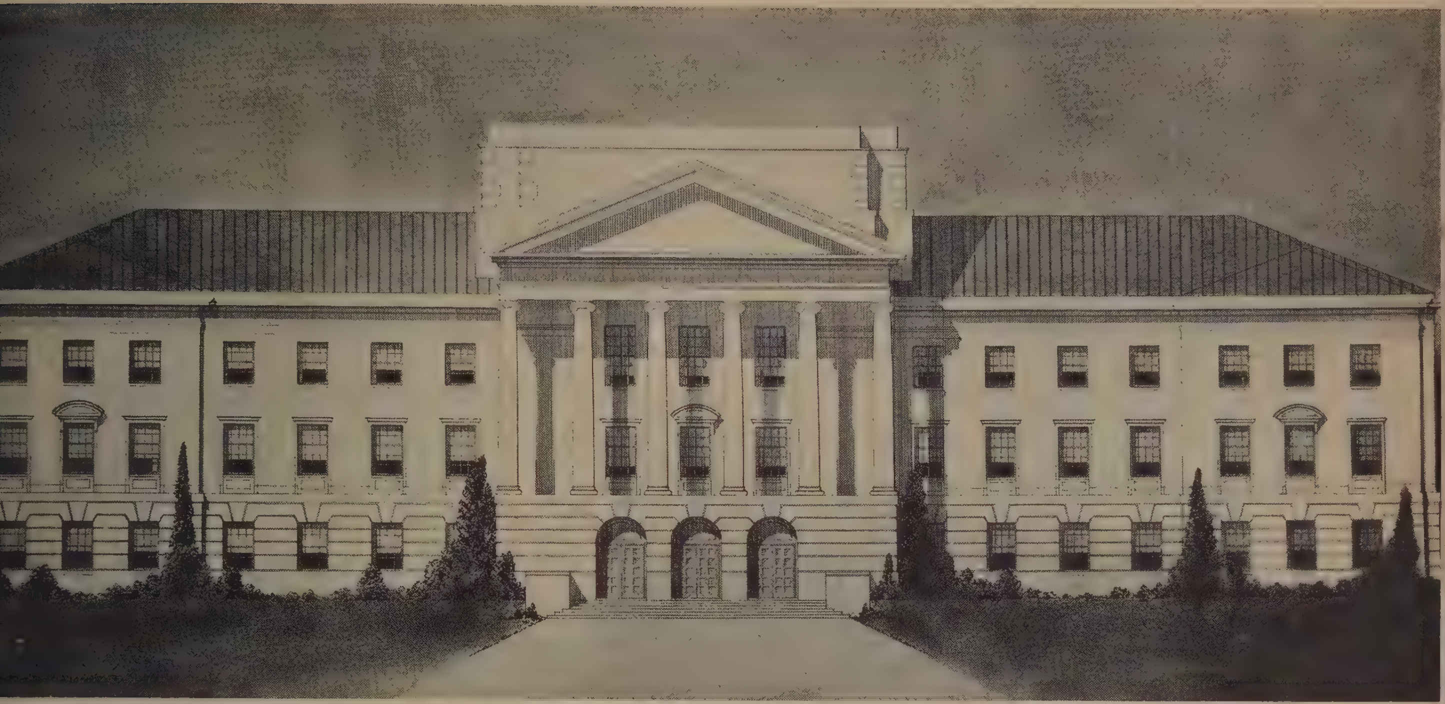

Staff artist's sketch of new Federal Court House now under construction at Columbia, S. C. In keeping with the architecture of the region, its style and detail are Colonial. Designed for the Treasury Department by Harold Tatum, Charleston architect; James I. Barnes, contractor, Springfield, Ohio.

Colonial Federal Court House

By D. L. Chaney*

FOR more than 150 years, the dominant style of architecture in South Carolina has been Colonial. Generations growing up since the beginning of the nation have known practically no other style for public buildings, churches and homes. Towns and cities of South Carolina present a harmony of architectural design not found elsewhere, that creates an atmosphere of history and tradition. The citizens are proud of their traditions and very fond of the architecture that symbolizes them.

Consequently, when a new federal court house was to be built in Columbia, S. C., it was the desire of the architect to produce a structure in keeping with the simplicity and charm of buildings of earlier construction in the community.

Under the original design for the project, the building was to have been erected of stone; but when the appropriation was revised, making it necessary to take advantage of every possible economy, the architect conceived the execution of the design in concrete to produce the desired result.

Since prototypes of the desired architectural style in public and semi-public buildings have heretofore been built of brick masonry and finished with stucco exterior, using stucco for cornices, run molds and other familiar details, it was quickly recognized that texture and detail suitable to the style could be faithfully produced in reinforced concrete. Therefore, the design was revised for reinforced concrete construction throughout except for the roof.

Work began in June, 1935, and the exterior of the building is now well advanced toward completion.

The federal court house, which will also be quarters for internal revenue offices and the United States weather

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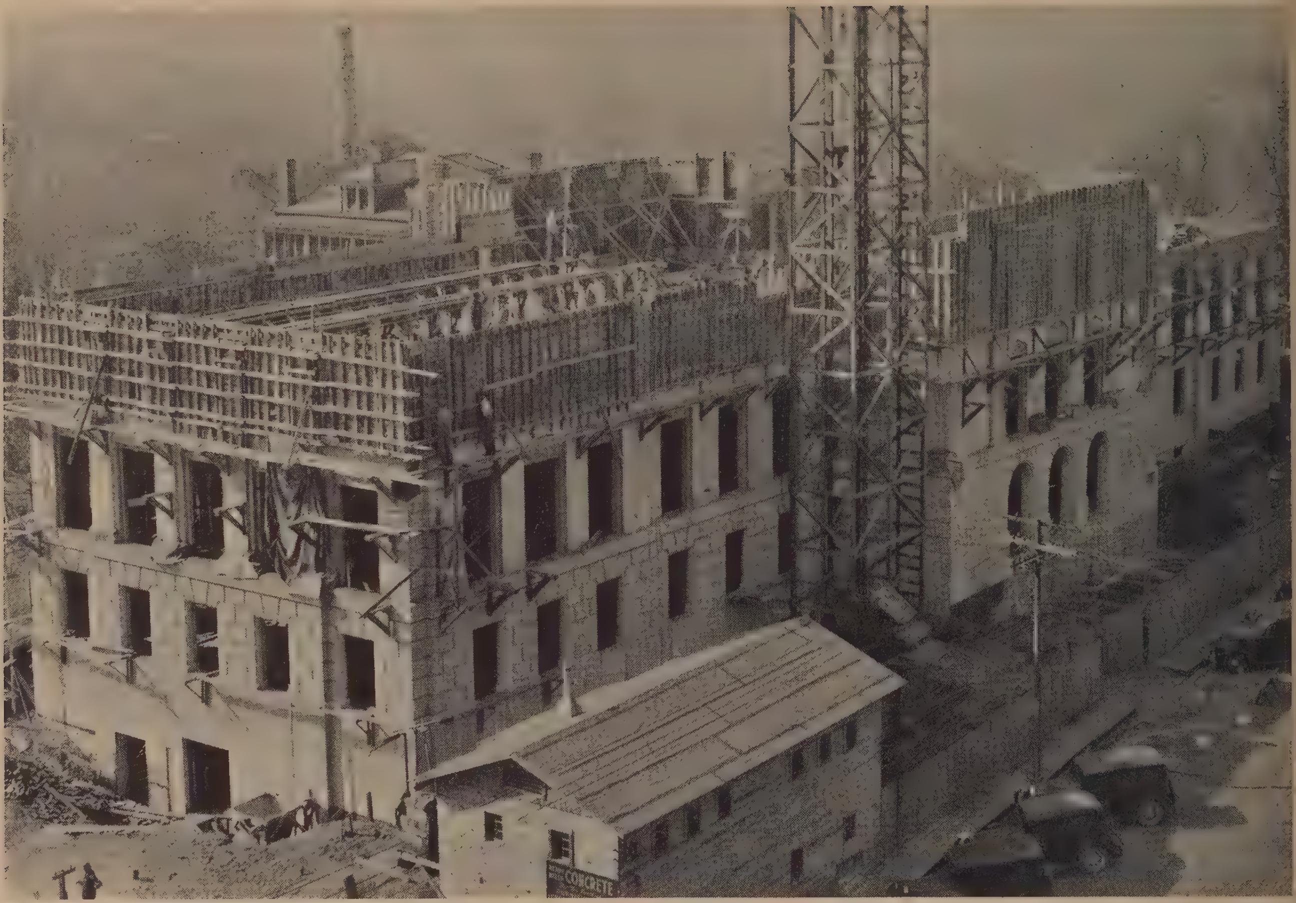
*Regional Structural Engineer, Portland Cement Association, Atlanta.



Forms in place for concreting third floor walls of new Federal Court House at Columbia. The quality of concrete and careful forming are evidenced by the clean-cut detail of the wall sections already completed.

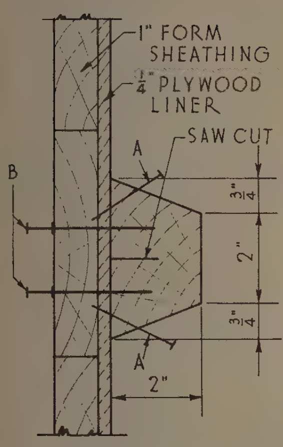
bureau, is three stories and basement. Located on Arsenal Hill facing Laurel street, it is 204 ft. in length, 85 ft. wide at the center section, and 51 ft. wide at the end sections. A penthouse structure—actually the fourth floor—will be occupied by the weather bureau office and observation station.

Ready mixed concrete, supplied by Concrete Construction and Supply Co., of Columbia, is being used on the project. It is proportioned to contain 5.65 sacks cement, .55 cu. yd. sand and .70 cu. yd. crushed granite measured damp and loose, per cubic yard of concrete. The mix is sufficiently rich to produce a plastic concrete that puddles readily into the forms. Approximately 7 gal. water per sack cement is used, producing a slump of about 4 in.

Concrete is conveyed from a central hopper to the forms in buggies and is placed through an elephant trunk in horizontal layers from 1 to 2 ft. in depth. The elephant trunk is moved along as the concrete is placed so the concrete does not flow laterally in the forms. Hand spading is used to compact the concrete. Very close supervision has been given to the spading of the concrete to be sure to secure smooth surfaces and to have the concrete fill in around the deep rustication strips.

Forms for the outside wall surfaces are ¼-in. plywood nailed to a solid backing of square edged boards. No attempt was made to save sheathing lumber by spreading the boards supporting the plywood. When this is done there is always a slight waviness to the surface that is visible in the sunlight. Studs are 2x4's on 16-in. centers with double 2x4 walers spaced 27 in. on centers. The maximum spacing of ties is 36 in. A placing schedule of not more than 3 ft. an hour was maintained to avoid any possibility of excessive deflection in the forms. Horizontal construction joints were shown on the architectural drawings in the form of a very small V inset on the exterior wall surfaces at various elevations. In general, the joints are located at the window sills and window heads (see illustrations).

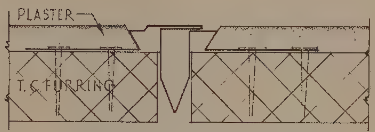
Spandrel beams from the window heads to the window sills are concreted with the floor slab in one operation. The concrete floors are finished with terrazzo in the corridors



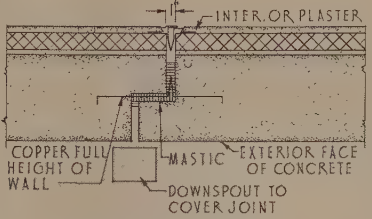
DETAIL OF RUSTICATION FORM

Left—method of applying rustication strips to form liners are shown in photo and sketch. The strips are nailed to the forms in a manner which permits them to remain in the rustications when forms are stripped.

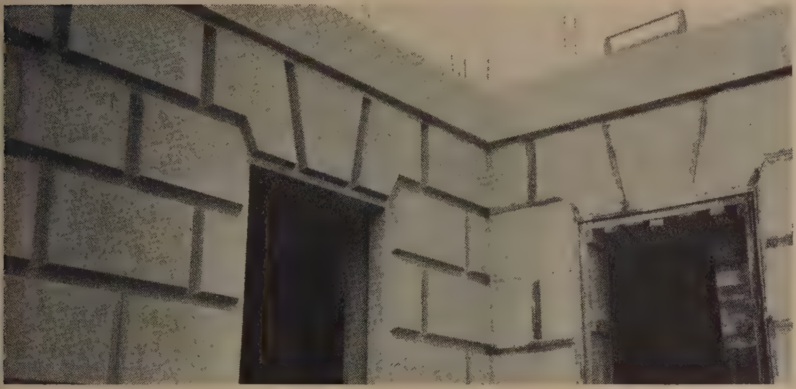
Below—expansion joints shown in the plan at bottom are obscured by downspouts. This is one manner of treating expansion joints so they will not mar the appearance of the building.



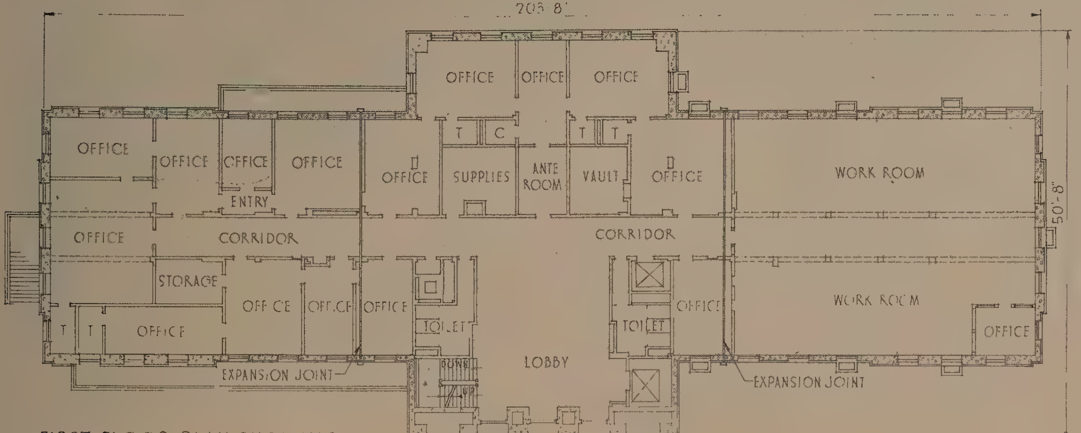
DETAIL OF METAL PLASTER GROUND AND EXPANSION JOINT CLOSER



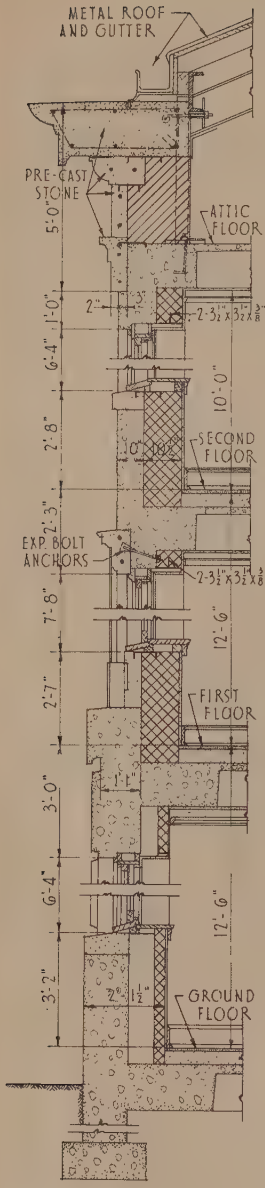
DETAIL OF EXPANSION JOINTS IN EXTERIOR WALLS



Rustication strips remain in wall until they shrink away from concrete.



FIRST FLOOR PLAN SHOWING LOCATION OF EXPANSION JOINTS



TYPICAL WALL SECTION

Corners were drawn tight to avoid any possible movement.

Detail of rustication and construction joint at water table.

and with wood elsewhere.

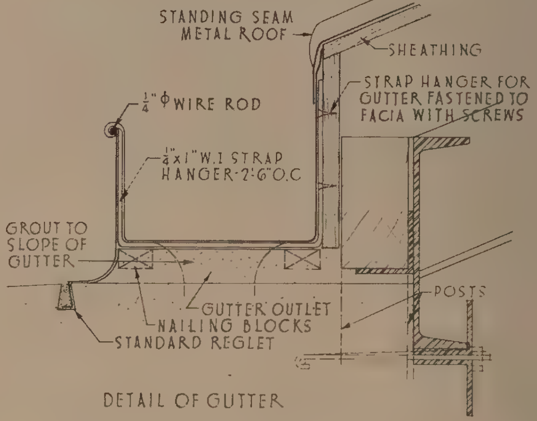
Upon removing wall forms, the exterior surfaces are lightly ground with a carborundum stone and white silica sand, securing a very uniform, light colored texture. After the concrete is thoroughly cured and the surface of the wall is dry, it will be lightly rubbed with a dry carborundum stone to remove any mortar that may have been worked up in the wet grinding. When concreting is completed, all wall surfaces will be treated with white cement paint.

One of the interesting features of the design in keeping with the architectural style is the coursed effect of the walls from ground level to the second floor. The rustication of the concrete surfaces is very deep and wide. Rustication strips 3½ in. wide by 2 in. deep with a ¾-in. bevel are nailed temporarily to the face of the plywood forms in the desired pattern. Double-headed nails are then driven from the back of the form, fastening the strips securely, and the temporary nails are pulled. When the forms are stripped, the double-headed nails are pulled first. This leaves the rustication strips in place. The strips, left to dry out and shrink, are then removed easily after the concrete is hard, preventing spalling and damage. A saw cut lengthwise in the strips prevents them from binding in the rustication. (See illustration.)

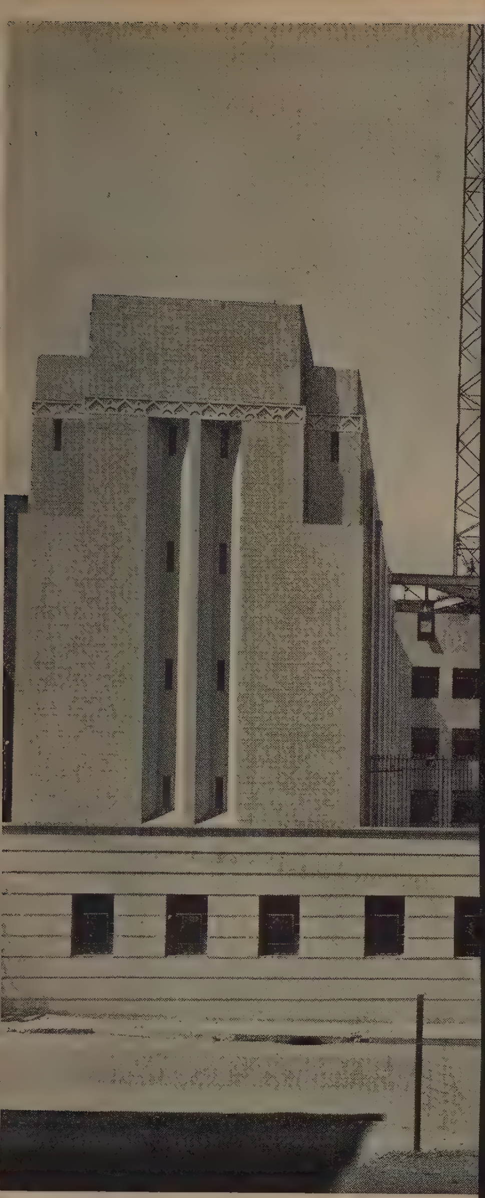
The quality of the job being produced is evidence of the importance of carefully designed and executed formwork.

The Columbia Court House was designed for the U. S. Treasury Department by Harold Tatum, architect, formerly of Columbia, S. C. The work is under the supervision of L. S. Mitchell, general superintendent for the contractor. F. O. Purcell is in charge of form work. A. W. Brown is engineer in charge for the Treasury Department.

The total cost of the building, including mechanical trades will be $253,920 or about 35 cents per cu. ft.



DETAIL OF GUTTER



Atlanta's Modern Jail

By Preston S. Stevens, A. I. A.

BACK in 1893, Atlanta, Georgia, dedicated a new police station hailed at the time as "the most modern and complete station house in the entire south." Forty years, however, have brought many changes with which the old structure can no longer cope. The helmet and night stick have given way to the Sam Browne belt and white-topped cap; motorcycle officers have replaced the old bicycle squad; fast cruising automobiles have crowded horses out, and radio has silenced the telegraph tickers. A greatly increased population has made a cramped building out of one that once seemed commodious and luxurious as jails go.

City authorities started action in 1933 to remedy these crowded conditions—so today we find the old building modernized and a new monolithic concrete jail section added to it. The new section, architecturally, is an adaptation of the modern style. Five stories high, and covering an area of 117 x 106 ft., it is designed for four additional floors *modernized by a veneer of cast stone. In style and color it matches the new jail building.*

when the need arises, at which time the present part will form the lower motif of the whole or final composition.

Barring an unexpected crime wave, however, the new jail should provide ample facilities for some time to come. It is fairly large and complete, including more than 70 cells, six ward rooms and nine special cells. The prison hospital on the second floor comprises an examination room, four-bed ward, nine sick rooms and doctors' quarters. In connection is a hospital unit for officers ill or injured while on duty.

On the first floor are located the receiving desk, detective bureau, identification bureau and record room. One section of the floor is walled-off for a small arms practice range. The three upper floors are identical in plan with single cells and ward equipment. There ar two dining rooms on each floor and a centra kitchen for the whole plant.

The design of Atlanta Jail, in which functionalism is the keynote, demanded a frank expression of the structural material in the architectural treatment. To have executed i otherwise would have been to ignore the decided trend of American architecture away from the ancient and medieval styles which, adapted to modern structural forms, have been little more than a sentimental skin stretched over the real bones and brawn o buildings. To reveal purpose in pleasing design, we now depend upon skilful use of line, mass and proportion expressed honestly in the material of construction, using ornament with restraint like milady chooses a small bit of fine jewelry to accent rather than compete with her natural beauty. Hence exterior walls and decorative detail, except a narrow band of terra cotta just below the parapet, are architectural concrete in harmony with the internal construction.

The texture of the walls is that produced by 6-in. surfaced T and G boards. The lower story is rusticated in contrast to the plain surfaces above, and a special effort was made to secure as smooth a texture as possible in this part of the wall without resorting to a form liner or rubbing. A more rugged texture was desired in the upper stories to harmonize with the scale of the building. This was accomplished by the use of panel forms in which the sheathing was not drawn up too tightly, thus accentuating joint lines very slightly. In buildings where masses and proportions require greater perfection of surface texture, unlined forms for plane areas should be erected in place rather than in panels because the joints between panels made of ordinary boards will always be quite pronounced.

Special precautions were taken to keep the reinforcement well back from the outside forms. The importance of careful inspection of this phase of the construction of architectural concrete buildings is sometimes overlooked with the result that the reinforcement, which is too close to the surface, corrodes and spalls the concrete. Such construction defects are no more necessary in a concrete building than are chipped brick or improperly bedded stone work in a masonry job. In the Atlanta Jail, 2-in. concrete spacer blocks were used to hold the steel back from the outside orms, insuring accurate location of the reinforcement.

We used a rather rich concrete, the proportions being pproximately 1:1½:3, the water content varied according o the particular use of the concrete. Ordinarily about a :2½:3¼ mix should be satisfactory, but because of the arshness of the aggregate and the close spacing of rein-orcement in some places, the richer mix was thought to be esirable in this case.

Exterior walls were finished on the outside with two oats of cement paint. This type of finish is inexpensive, osting only about 2 cents a square foot, and it is quickly pplied. We have found it desirable to let the walls age bout 60 days before the cement paint is applied. Just efore painting, the concrete should be wet down to reduce bsorption of water from the paint. Most important—the ement paint should be cured by keeping it wet just as ny other concrete work is cured.

No furring of the exterior walls was considered necessary n this climate, and the experience to date indicates there vill be no trouble from condensation. The inside surface f the exterior walls and all concrete partitions are painted with cream colored enamel, making it very easy to keep the building clean and sanitary.

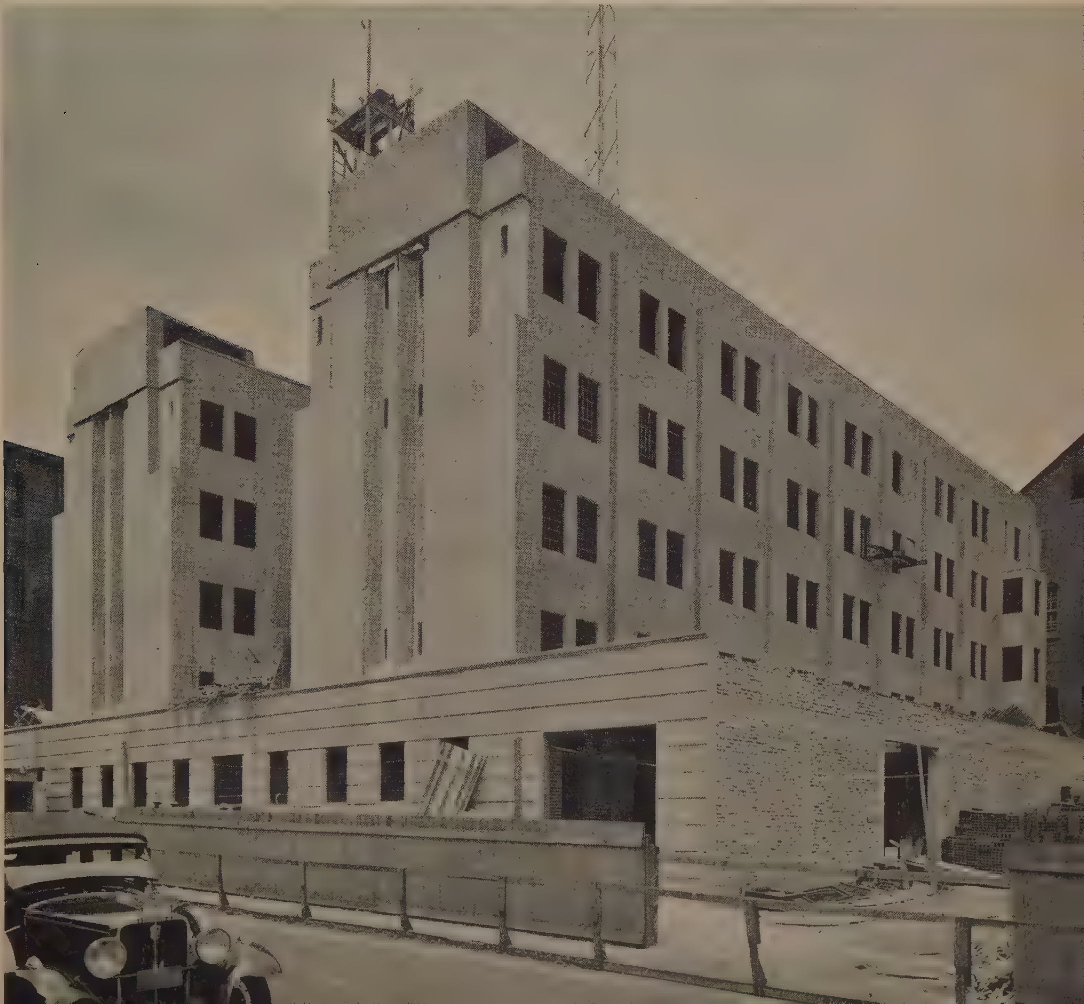
As completed, the new jail provides 70,000 sq. ft. of floor area at a cost of $270,000, including equipment. The structure was financed by PWA loans and grants. Plans were made, approved, and the building completed under the administration of Mayor James L. Key of Atlanta.

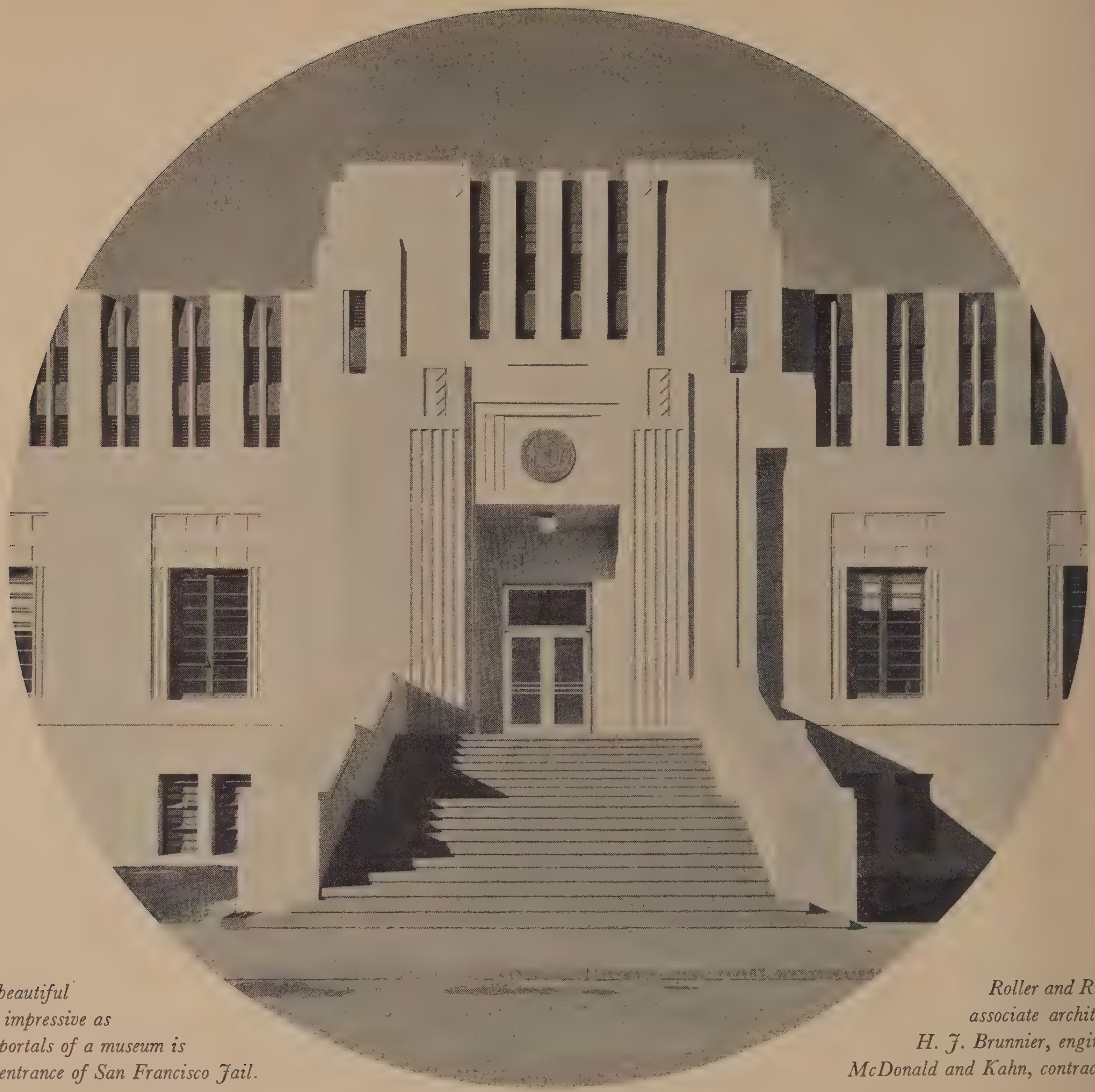
Structural design of the jail was the work of Robert Lose; Pittman Construction Co., of Atlanta, was the contractor.

Shortly after concrete work was finished on the new jail structure, modernization work commenced on the old station house. Formerly a brick building with a suggestion of Romanesque architecture, it was given new fenestration, and simplified in general outline. To complete the modern effect, the building was veneered with light colored cast stone in large panels. The accepted practice of anchoring and bedding the panels in place was followed.

In its new dress, the old building has modern lines and detail which, in effect, harmonize with the new structure nearby. As remodeled and strengthened, it is practically a new building, good for many years to come.

In Atlanta Jail, pleasing effects were obtained by skilful arrangement of line and mass. Ornamentation, in the pure sense, is ractically eliminated. The honestly revealed concrete walls were finished with two coats of ement paint in a light color.





As beautiful and impressive as the portals of a museum is the entrance of San Francisco Jail.

Roller and Riedy, associate architects; H. J. Brunnier, engineer; McDonald and Kahn, contractors.

What Has Happened to Jails?

By Homer M. Hadley*

IMPROVEMENT in jail construction during the past two decades has been from the inside out, and rightfully so. New thought in regard to criminal detention has decreed that prisoners have as much need for light, air, cleanliness and privacy as people on the outside. In view of limited funds, it has often been necessary to design and equip jails for efficiency and health more than anything else; and since prisons serve a rather isolated and seclusive function, their appearance from the outside has not been of prime importance.

Recent jail construction, however, indicates the passing of the gloomy, bastile-like pile whose thick, menacing walls and slit windows invariably suggest filth, cruelty and fear. It is being rapidly replaced by a new type of jail which, in appearance, is not very different from buildings of more respectable occupancy in the surrounding community.

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*Regional Structural Engineer, Portland Cement Association, Seattle.

San Francisco County Jail was designed to combine in one structure a strong, efficient and healthful jail and a pleasing building to the observer on the outside. Barred windows, the distinguishing feature of jails, were no handicap in giving interesting treatment to this prison. In fact, the features that give light and air within are those which determine the exterior architectural motif—for the alternating dark and light verticals are the windows and walls of 480 individual cells.

The main jail, for men only, stands near the center of a 250-acre farm plot. A smaller women's prison is located some distance away. Other buildings include stables, corrals, a greenhouse and a sewage disposal plant. All are built of reinforced concrete and their architectural treatment is similar.

The main building comprises a two and three-story administration unit, a tall central tower and two six-story wings. The central tower separates the two wings and from the second floor up is an open shaft around which the stairways and elevators are grouped. There are no stairs or fire escapes at the ends of the wings and everyone going to and from the zones of confinement in the four upper floors must pass the scrutiny of guards stationed on the second floor of the central tower.

On the first floor of the wing and tower unit are kitchen, bakery and various rooms for storage of equipment and supplies. All meals are served in the cells, hence there are no dining rooms or assembly halls.

The administration unit, integrally connected with the central tower, contains offices, receiving rooms, visiting rooms, shower and dressing rooms, chapel, class rooms and a medical center.

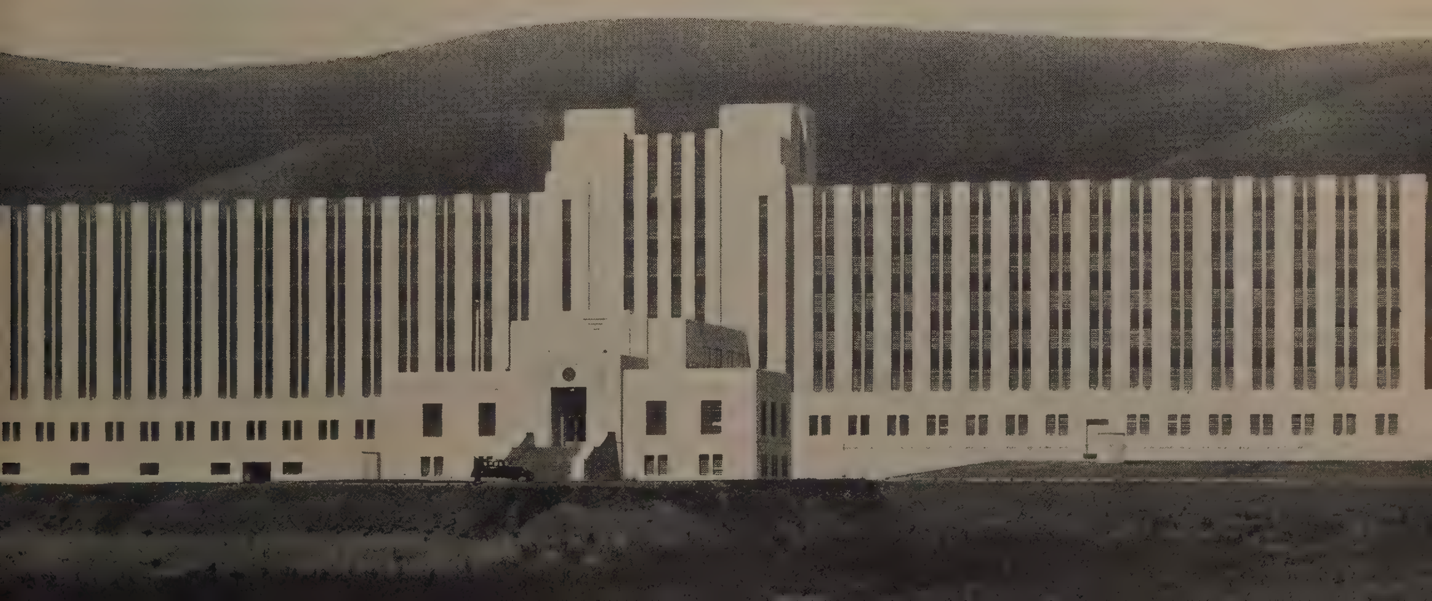
The entire structure is built as a single monolithic concrete unit without expansion joints. The floor framing in the wings consists of single 31-ft. beams, spaced 10½ ft. on centers, extending without interior support from wall to wall. Exterior walls are 18 in. thick, giving the upper portion of the wings an outside dimension of 34 ft. From end to end, the structure is about 400 ft. The central tower rises to a height of 105 ft., and the wings, 76 ft.

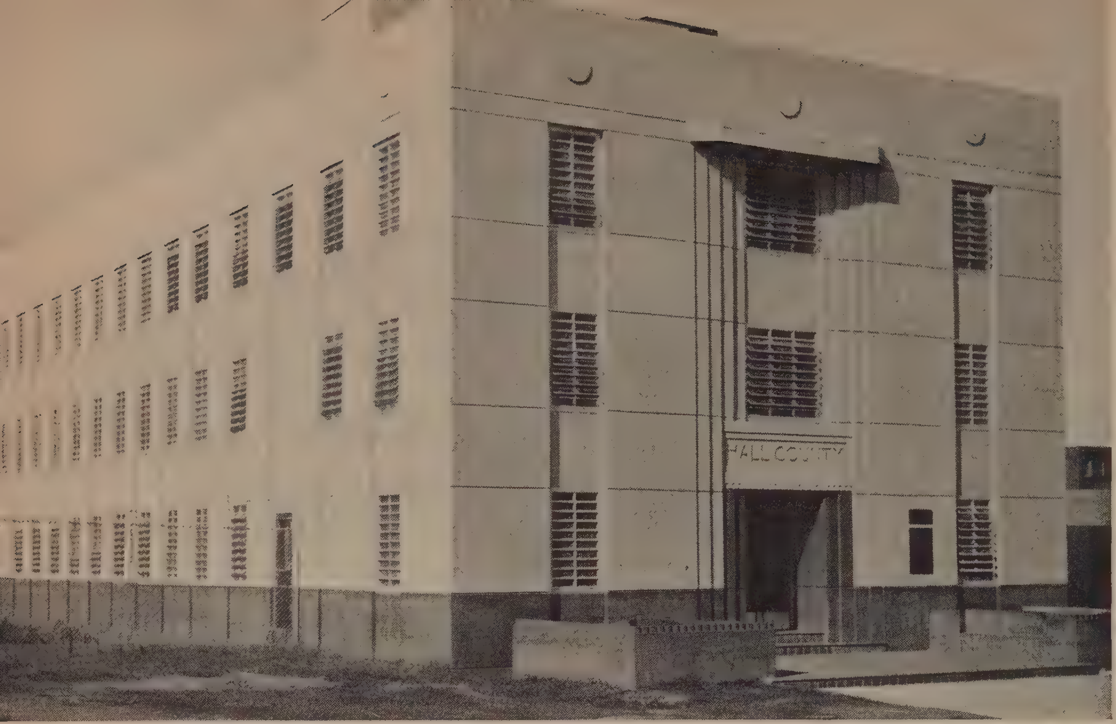
Matched 1x6 boards with mitered corners were used for exterior form facing. The rough, rugged concrete surfaces give the building a fine note of harmony with the surrounding mountainous country. The tall piers were given a buff color by the use of a cement wash. Spandrels, for purpose of contrast, were painted dark olive green.

Plywood panels were used for the form facing for interior walls. These walls were then given a light gray-green shade by means of two coats of lacquer. The same treatment was given to the underside of the floors.

The proximity of the San Andreas fault made the study of lateral forces one of the important structural problems. By taking advantage of the interior walls which, of necessity, were reinforced concrete, it was possible to design for a minimum lateral force of 20 per cent gravity at normal stresses. Uneven soil conditions made it necessary to excavate to different levels for footings and to backfill with material compacted to a specified degree so that all portions of the structure would settle uniformly as load was put on during construction. The concrete was specified for a minimum strength of 2,500 pounds at 28 days.

A perfect match for its rugged surroundings, San Francisco Jail's wall texture is rough, the grain marks and joint lines giving strong character to the row of evenly spaced piers. Dark, olive green spandrels contrast with light buff columns.





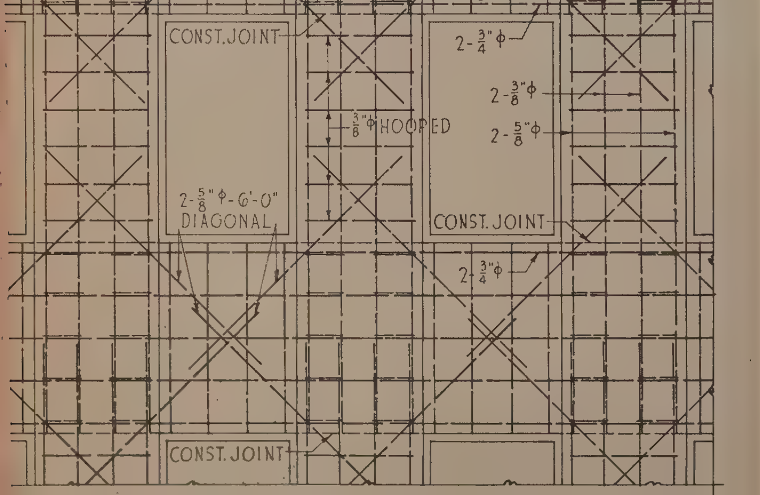
This modern building replaced an old unsanitary jail building at Gainsville, Hall County, Georgia. William J. J. Chase, Atlanta, was the architect. A. K. Adams and Co., Atlanta, was the contractor. The entire structure is monolithic concrete.

Replacing Old County Jails

By William J. J. Chase, Architect

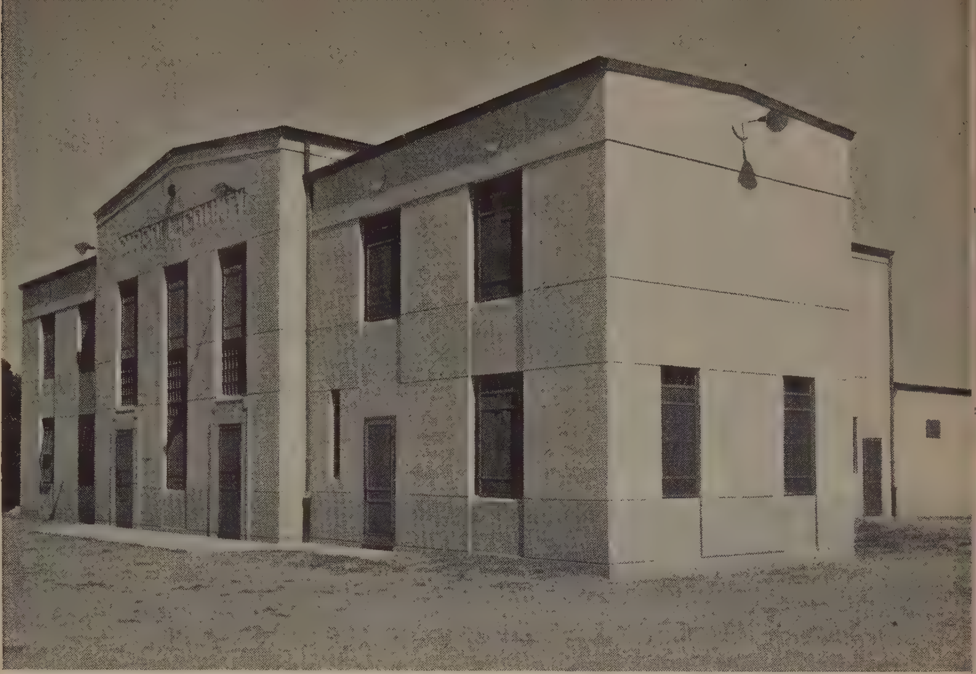
THE past few years have witnessed a new, humane attitude toward prison detention. As fast as it has been financially possible, states and communities everywhere have been building new facilities in which sanitation, comfort and safety are given equal consideration with control and discipline. The idea behind this change has not been to pamper criminals and make them idle wards of society, but to attempt some form of reclamation. Since a large majority of prisoners are released after serving varying lengths of time, their health, mental state and occupational talents, which can be greatly influenced during their detention, are important in the protection of the rest of society.

Arrangement of reinforcement in Hall County Jail.



Two new detention buildings, recently erected in Georgia counties, join the rapidly growing list of modern prison plants. One, at Carrollton, Carroll County, replaces a system of cramped, unsanitary, uncomfortable sheet metal wagons used as barracks for convicts working on highway and other projects. Escapes were frequent from these old wagon cages. Another, at Gainsville, Hall County, is a county jail, replacing an old, unsanitary building.

Both of these structures present a striking contrast to the usual type of jail. In fact, if one may be permitted to say such about jails, they are distinct architectural improvements to the community rather than being depressing structures for incarceration of unfortunate and vicious people. The function of these buildings has dictated the architectural design which is characterized by simplicity of detail. To the so-called modern architectural style, concrete is



New prison barracks at Carroll County, Georgia, replaces a fleet of wagon cages formerly used to house prisoners working on roads and other public projects. William J. J. Chase, architect; A. J. Honeycutt, contractor, Birmingham.

particularly well suited and was accordingly chosen for both the Carrollton and Gainsville structures.

The Carrollton prison barracks is T-shaped, comprising a main stem 81x36 ft. in plan, with wings on each side 18x27 ft. It is two stories high without basement. Walls, partition, floors and roof are all of reinforced concrete constructed as a true monolith. Exterior walls are 8 in. thick and partitions are 4 in. thick. All architectural and decorative detail was formed and cast in place. Forms lined with Presdwood produced a smooth, dense surface broken by tiny air bubbles in random distribution, giving the walls a most pleasing texture and appearance. Exterior walls were finished with two coats of heavy concrete paint.

These barracks provide for 75 to 100 prisoners, and are arranged so that white and negro prisoners may be handled without intermingling. Interior walls were sealed and finished with two coats of heavy floor enamel. If desired, a hose may be turned on walls, ceiling and floors which can be easily scrubbed without damage. Unit heaters and a system of exhaust and ventilating fans provide for adequate temperature control.

J. L. Veal, of the Carroll County Commission, was in charge of the work and A. J. Honeycutt, Birmingham, Ala., was the contractor.

Hall County Jail at Gainsville, in general structure, is similar to the Carroll County Prison. Being a jail for general use, however, it is arranged differently—providing for the several classifications of prisoners under various conditions.

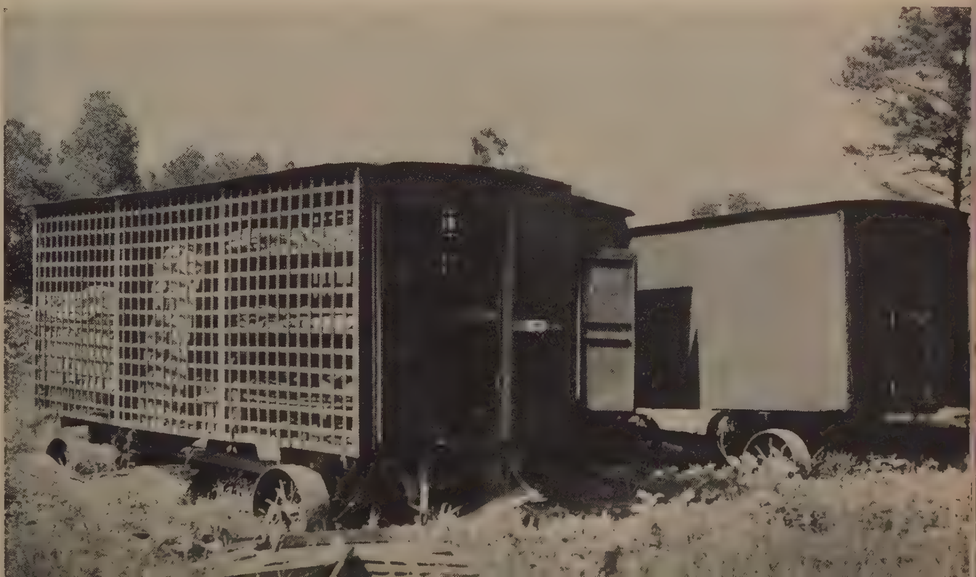
It was intended originally to design Hall County Jail with exterior walls other than reinforced concrete. But, after study, it was realized that since so much concrete was to be used in the interior of the structure, it was logical and economical to make the exterior walls of concrete also.

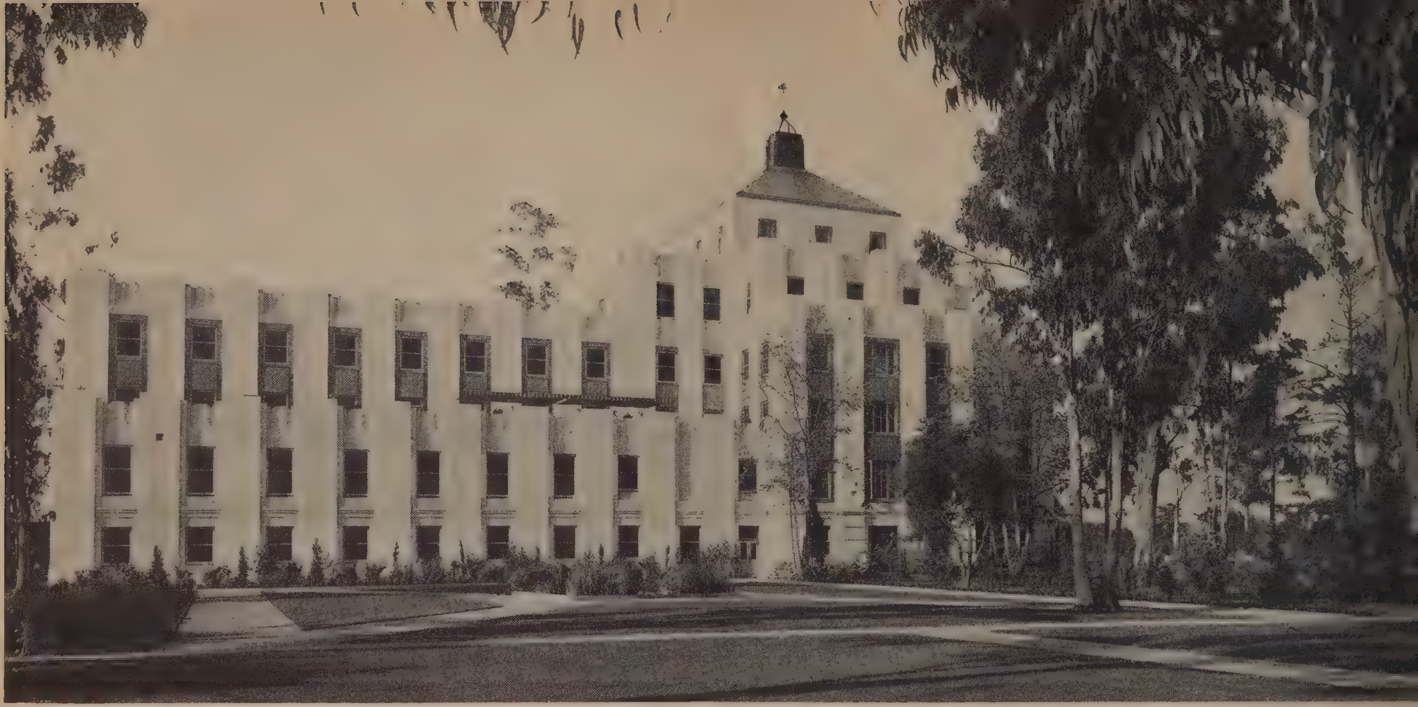
The building is rectangular in shape, with dimensions of 43x95 ft., three stories high. Exterior concrete walls are 10 in. thick. The thickness of partitions varies from 3 in. to 8 in. At one side of the building is an open air recreation yard, 100x120 ft., surrounded by a concrete wall 12 ft. high.

Adequate reinforcement of monolithic concrete walls is essential to prevent shrinkage cracks. Small bars spaced quite close together are much more effective than large bars far apart. A double layer of $\frac{3}{8}$-in. round bars were accordingly used for the main wall reinforcement. Additional reinforcement was provided around all openings—horizontally, vertically and diagonally. An accompanying drawing illustrates the typical reinforcement for both jobs. Window bars were anchored directly in the concrete walls.

Hall County Jail was built under the administration of J. P. Davis, chairman of the County Commission, by A. K. Adams and Co., Atlanta contractors. The structure and equipment cost about $135,000.

From these old-time prison wagons escapes were frequent. Cramped and exposed, they were unsanitary, dangerous to health and difficult to operate.





Sweeping lawn and graceful eucalyptus trees make an incomparable setting for Palo Alto Hospital—modern in detail, construction and appointment. Reed and Corlett, architects; G. M. Simonson, engineer; K. E. Parker Co., contractor.

Palo Alto Community Hospital

By Will G. Corlett, A. I. A.

THE modern fireproof Community Hospital for the City of Palo Alto, Calif., on the Stanford University campus, replaces an old frame structure. The old hospital, established in 1909 as the Peninsula Hospital, a private venture, was taken over by the city in 1921. By agreement, Stanford University operated the hospital for the city, the latter paying all deficits and receiving profits if any accrued. When the old building became inadequate in size and equipment in 1929, a new structure was planned to be operated under the same agreement.

Uniform in treatment and finish on all sides—though unsymmetrical in mass—the new hospital is a conservative modern expression of vertical lines and setback elements, dignified and simple in composition, terminating in a square pylon with a pyramidal roof over the crossing of the wings. The building is five stories high with a sixth-story penthouse. The layout is such that the short wing may be lengthened at some future date to double bed capacity.

The building is reinforced concrete throughout, built on good foundation in accordance with requirements for fire and earthquake resistance. Reinforced concrete walls, columns, beams, girders, slabs and foundations make the structure an integral unit, with each story designed to resist horizontal forces acting in any direction. The lateral force was taken at 15 per cent of the total dead load above the level considered. It is interesting to note that this force for the entire building is 2,124,000 pounds, equivalent to 350 pounds per sq. ft. of wind pressure over the entire area of the building in one direction, or 150 pounds per sq. ft. over the broad side area. The distribution of this force through the structure was made on the basis of relative rigidity, and the disposition of walls is very favorable for this type of design. Footings were designed for dead load plus ½ the live load with allowable soil pressure under total load of 6,000 pounds per sq. ft.

It may be of interest that this building, according to the last information available, carries the lowest earthquake insurance rate made on buildings in California, although it is located on Stanford University campus close to the San Andreas fault where damage was done in 1906.

Exterior treatment of Palo Alto Hospital is exposed concrete as it came from the forms, unplastered, but finished with a bright buff-colored cement paint. The absence of ornament, except at the main entrance, is in keeping with design simplicity. The wall texture was made by the use of 1x8 common shiplap form sheathing, sized to uniform width. The boards were placed with the rough side to the wall. In some places where milled lumber had to be used, the surface was combed to produce a texture similar to that of rough lumber.

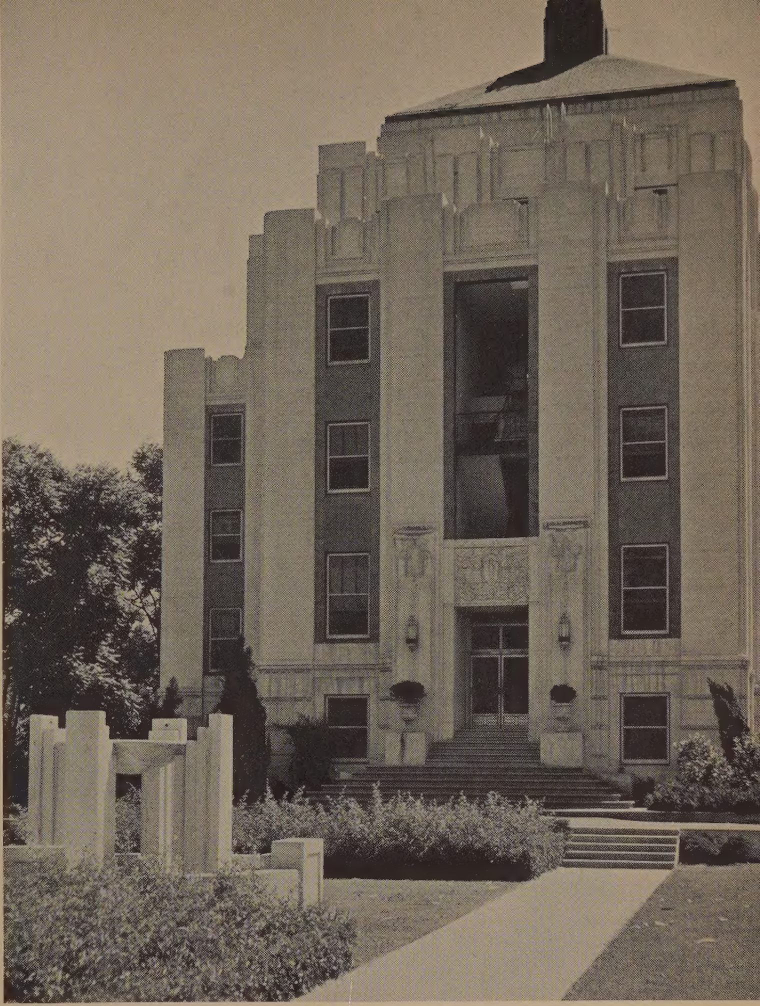
For first floor walls, the form boards were placed horizontally except for window jambs and casings. Above the second floor the form boards were set vertically except where obvious horizontal motifs were required. The contractor was required to submit sketches of all formwork for approval before any construction was begun. One-quarter-inch round pencil rods, slanting upward from the outside, were used as form ties. These ties were pulled from the inside so that the ends were 1 in. back from the outside surface of the wall. The tiny holes were then patched with a 1:2 cement mortar. The result is a uniform texture with no perceptible patching anywhere on the wall surface.

The cast stone used for simple ornamentation about doorways and other places, is of the same general color and appearance as the monolithic wall surfaces. All cast stone units were reinforced with deformed steel rods and provided with ¼-in. wire loops for anchoring.

The interior was finished with plaster and glazed tile with acoustic treatment for ceilings of corridors, nurses' stations, nursery and other service departments.

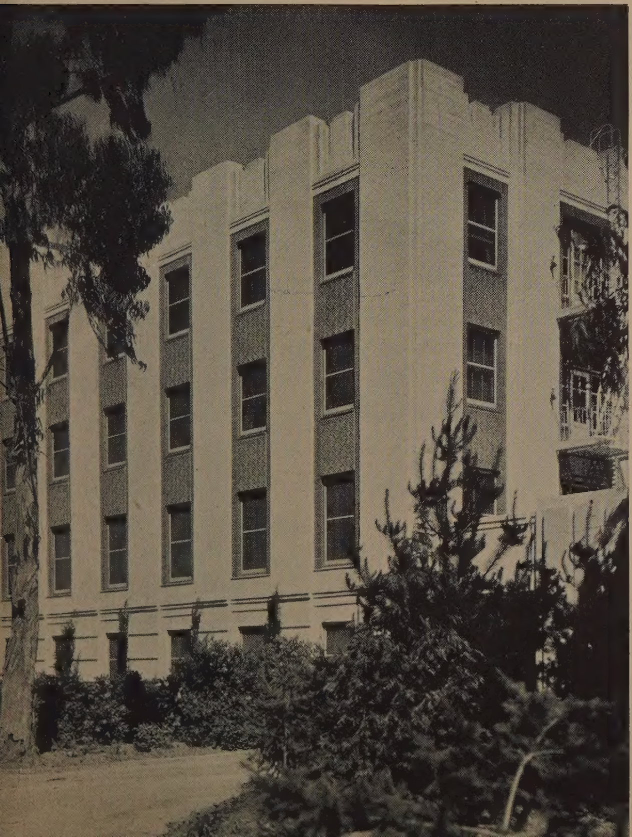
The building is "L" shaped. It is orientated so a line due south bisects the angle between the two main wings, permitting the sun's rays to reach all walls and adjacent ground at some time every day the sun shines.

Main public entrance is at the end of the short extension of the long wing, and the service entrance is at the opposite end with the ambulance entrance midway in the length of the wing. This arrangement assures a minimum of disturbance to patients and eliminates and screens from view all vehicular and pedestrian traffic.



Monolithic concrete walls reveal form marks through a light colored coat of cement paint. Ornament is kept to a minimum.

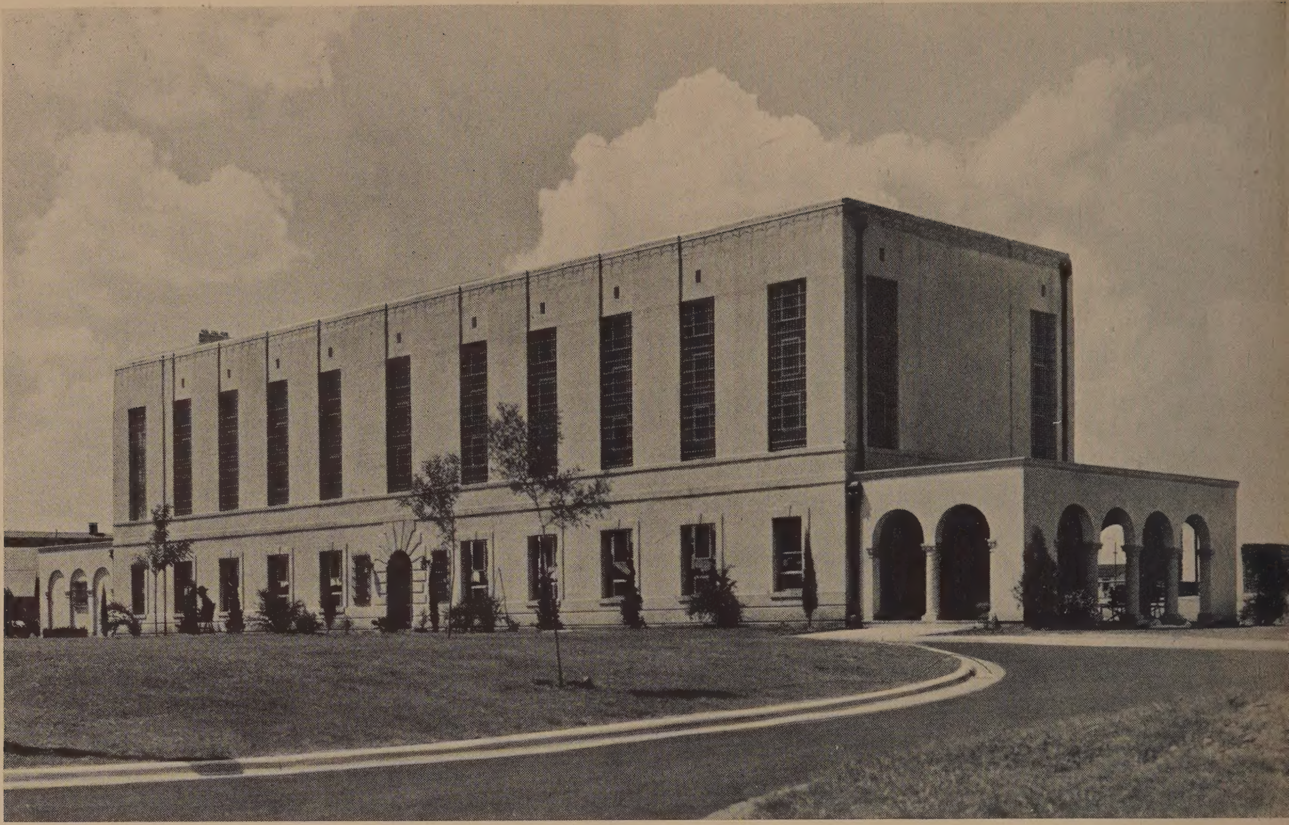
pilasters form the principal architectural motif of the building.



Adequate fenestration is provided, giving large, well proportioned windows in every room.

The first, or ground floor, provides a receiving room, storage, ambulance entrance and emergency rooms, boiler room, refrigeration plant, locker and laundry. The second, or main floor, is reached directly from the main entrance. Here are located the lobby, offices, kitchen, dining room, record room and internes' quarters. Other departments, wards and private rooms are in the three upper floors.

Palo Alto Hospital was financed by means of a $250,000 bond issue, donations to the extent of $42,000 and certain other municipal funds, a total of approximately $400,000. Designed by Reed and Corlett, architects and engineers, the K. E. Parker Company was contractor and G. M. Simonson electrical and mechanical engineer.



Most modern prison at any U. S. army post is this one at Fort Sam Houston, Texas. Designed by Jno. M. Marriott, San Antonio, under the direction of the Construction Quartermaster, the prison is monolithic concrete. Gilbert Falbo, San Antonio, contractor.

Post Prison—Fort Sam Houston

By Jno. M. Marriott, A. I. A.

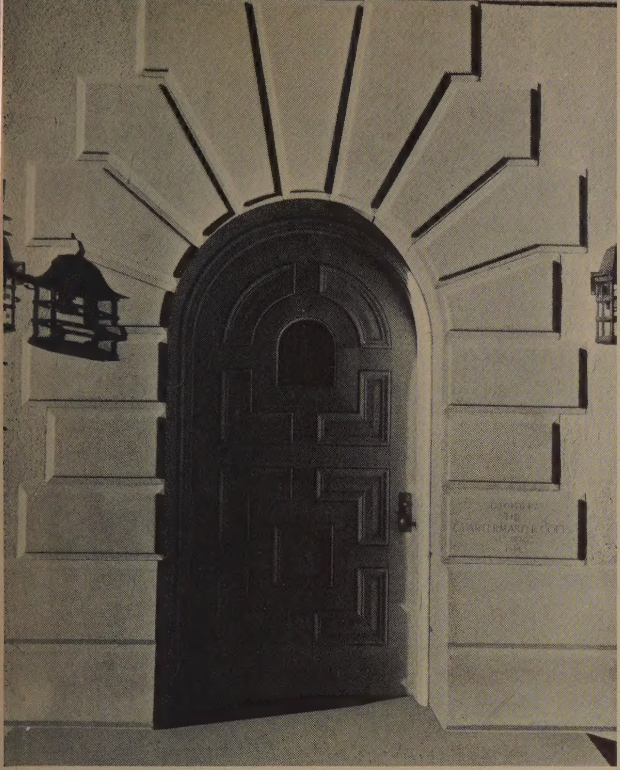
THE new post prison at Fort Sam Houston, recently completed and occupied, is one of the most modern prisons at any U. S. army post. This applies to its architecture as well as to the equipment. The function of the building is clearly expressed but without too great emphasis on thick walls and iron bars.

Designed by the writer under the direction of Capt. A. F. Dershimer, construction quartermaster for Fort Sam Houston and vicinity, the prison is built of monolithic concrete. It is three stories in height, resting on reinforced concrete foundations supported by concrete piles, 35 to 50 ft. long. The piles have belled ends to increase the load carrying capacity which is necessitated by the low bearing value of the soil.

When the structure was planned, alternate designs were made for monolithic concrete construction and for reinforced concrete frame with brick enclosing walls. Bids showed that monolithic concrete would cost about $2,000 less than the masonry construction or slightly under 5 per cent of the total cost. It was considered to the best interest of the government, therefore, to use concrete—not only for the lower first cost, but because the nature of the structure demanded a permanent, escape-proof construction.

The building was completed during 200 working days. Construction progress, however, was delayed for about 40 days owing to foundation trouble and heavy rains; but once the foundation was finished, one complete floor was built about every three weeks. A complete set of forms was made for the first story and was reused twice to complete the building. No delay was occasioned by having only sufficient forms for one story, as the building was large enough to permit forms at one end to be stripped and re-erected while the forms at the other end were still in place.

Forms were built in sections and lined with plywood in



Exterior walls were given two dash coats of a cement-sand mixture. The trim about the entrance is cast stone.

order to secure a smooth finish on the exposed surfaces of the walls. The Richmond "Tyscrew" was used for form ties and proved quite satisfactory. Seven days were allowed after concreting before the ties were removed.

All concrete walls are 12 in. thick, reinforced with two rows of ½-in. round rods 9 in. on centers. This amount of reinforcement is somewhat greater than ordinarily used but was believed warranted to eliminate any chance of shrinkage cracks. The inner row of bars was staggered with the outer row. Floors throughout are reinforced concrete beam and slab type while the concrete roof slab is carried on steel I-beams. There are no columns inside the building.

The concrete for the first story, 10 ft. in height, was placed in one continuous operation. The second story, which is 18 ft. in height to accommodate double tiers of prison cells, was also completed in one operation by placing the concrete through openings in the inside form. Similar practice was used for concreting the third floor.

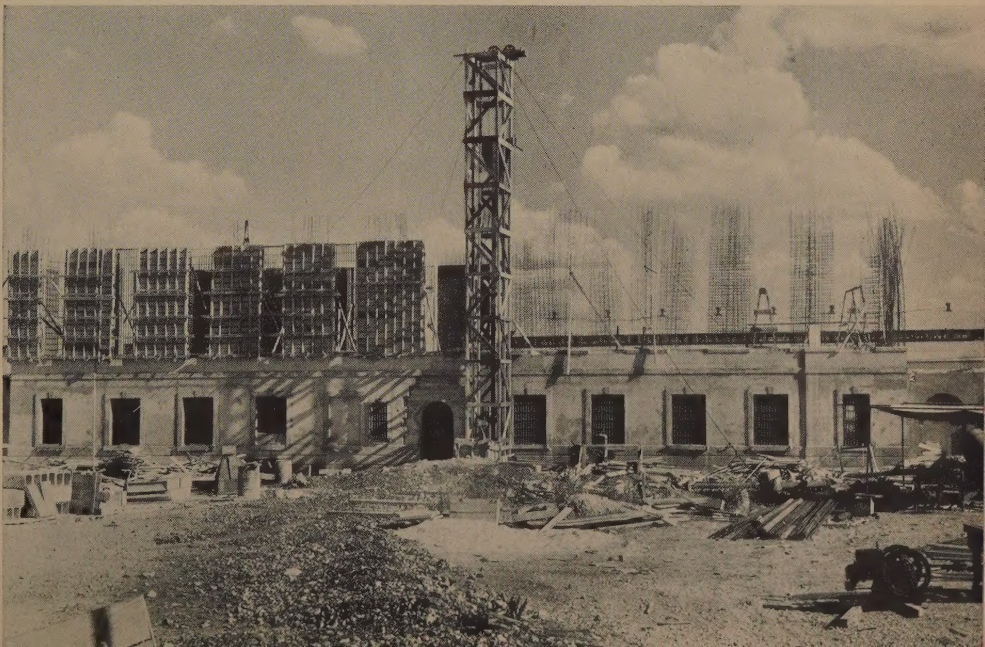
As shown in one of the accompanying illustrations, the reinforcement was placed above the first story before the outside forms were erected. This method was quite satisfactory for this job because the walls consisted essentially of relatively narrow piers between windows. Ordinarily such practice is not to be recommended because the long bars interfere with erecting the forms and it is more difficult to get the steel in the proper position.

Exterior walls of the prison were given two dash coats of a buff-colored cement-sand mixture. This treatment gives an unusually pleasing effect with the cast stone trim of the doorways and the long, vertical steel window guards. The inside surfaces of the walls were rubbed smooth with carborundum bricks and painted with two coats of waterproof cement paint.

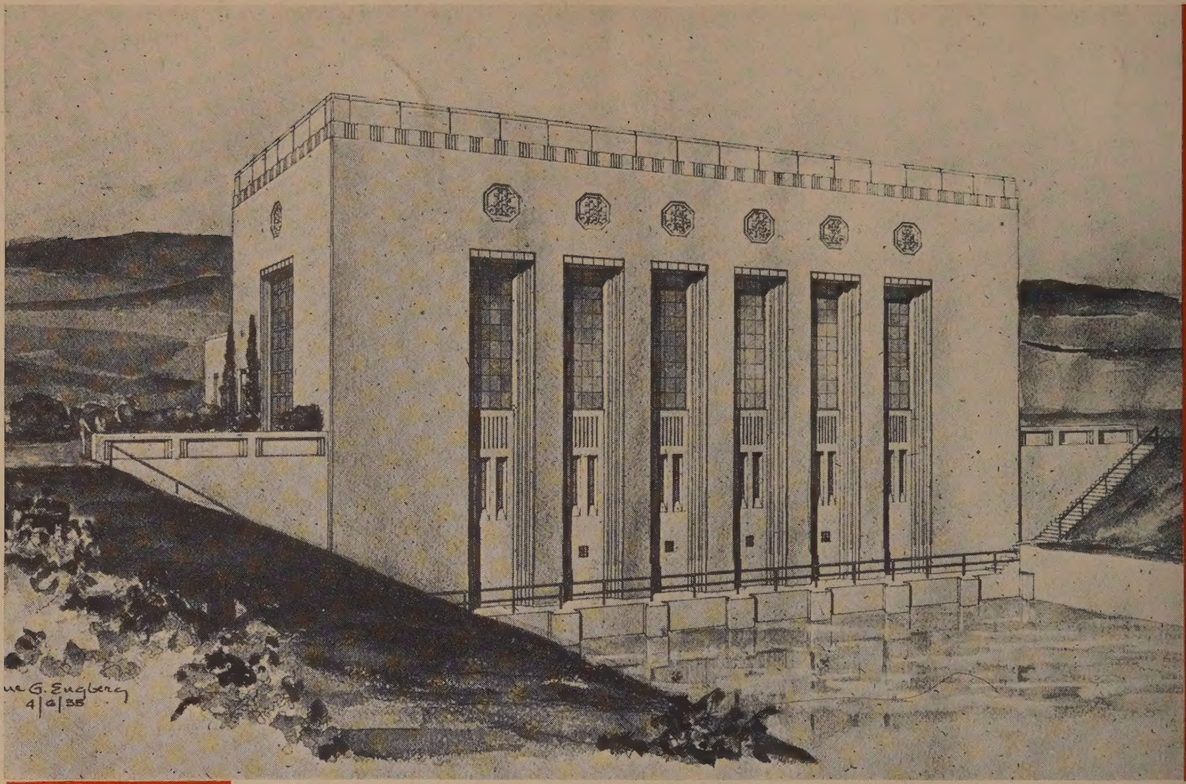
Steel window guards were set in place in the forms and were anchored into the concrete walls so as to make the building as nearly escape-proof as possible. All sash and doors throughout the structure are of steel especially designed for prisons. The prison installations were made by the Southern Prison Co. of San Antonio.

Exclusive of the steel prison work, the structure cost about $47,000. Construction work was done by Gilbert Falbo, San Antonio contractor.

From the standpoint of durability, security and beauty, it is believed that no better type of construction could have been adopted for Fort Sam Houston post prison than monolithic concrete. The writer is now more convinced than ever that it is the best and most economical type of construction that can be used.



Reinforcement was placed above the first story before the outside forms were erected, a method satisfactory because the walls consisted of relatively narrow piers between windows.



● *This distinctive power house, under construction at North Platte, Nebraska, was designed to symbolize the power and energy developed within its walls. Concrete was chosen as the natural medium. Said its designers: "To this end we used plain surfaces and simple lines, strengthened with deep reveals and window recesses, giving strong vertical accents growing out of the deep cut of the tailrace." Donald D. Price, chief engineer; Parsons Klapp, Brinckerhoff and Douglas, consulting engineers.*

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